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VOLUME IX. NUMBER 6.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

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CHICAGO, JUNE, 1905.

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Telephony.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

VOL. IX. CHICAGO, JUNE, 1905. No. 6.

National-Interstate Telephone Convention

CHICAGO will be the mecca for Independent telephone men of the United States on June 20, 21 and 22, when the annual convention of the National-Interstate Independent Telephone Association will be held at the Auditorium Hotel in that city. That it will be the greatest convocation of Independents ever held in this country is an assured fact; at least 250 accredited delegates will be present, and enough others will attend to bring the number up to a full thousand—a truly representative gathering of representative Independent telephone men.

President James B. Hoge of the National association, who, with President Theodore Gary of the Interstate association, is in charge of the convention arrangements, has written TELEPHONY to the effect that from advices received by him the indications are that every section of the country will be represented at the convention by delegates. Pennsylvania, for instance, will be on hand in full force, the delegation from that state having chartered two special cars to bring them to Chicago. Other states, no doubt, will be as enthusiastically represented.

The manufacturers and supply men also will be on hand in force, the entire sixth floor of the great hotel already having been reserved for exhibit purposes. This feature of the convention alone will be worth traveling across the continent to see, as it assures the greatest array of telephone and kindred products ever shown at a telephone convention.

AUDITORIUM HOTEL AND ANNEX—HEADQUARTERS AND MEETING PLACE OF NATIONAL-INTERSTATE CONVENTION.

The programme will be nothing lacking in interest and variety of subjects treated. It will comprise an unusual number of strong features in the way of instructive papers by some of the most prominent Independent telephone men in the country, which are sure to be intensely interesting and to arouse a general and fruitful discussion, as it is proposed to devote from fifteen minutes to half an hour in discussing each paper. The programme as arranged to date is herewith presented. There will of necessity be a few changes made, but this will give an intelligent idea

of what the finished programme will be. Among the speakers on this occasion will be heard James B. Hoge of Cleveland; Theodore Gary of Macon, Missouri; Breckinridge Jones of St. Louis; James J. Brailey, Jr., of Toledo; Samuel G. McMeen of Chicago, and other men prominent in the Independent field.

The plan adopted by the committee-in-charge is to bring together on the morning of June 19 in Chicago forty-eight representative Independent telephone men, to be divided into four committees of twelve each, to report on the following branches of the telephone business: Standard Operating Rules and Regulations, Standard Forms of Accounting, Standardization of Equipment and Best Methods of Advertising. This indicates that reports will be made at the convention of more than ordinary interest to the Independent fraternity.

In addition to this the papers arranged for and the subjects assigned, as well as the gentlemen selected to handle these subjects, are all evidences of strength in the programme.

The members of the Advisory Board and the Executive Council will meet in Chicago on June 19 at 10 a. m., for the purpose of arranging all matters of detail connected with the convention, as provided for in the by-laws of the association.

The roll call of states should be an especially valuable feature of the programme, for the reason that it will give everyone in attendance a good idea of the telephone situation throughout the entire country.

The entertainment committee is composed of the following named gentlemen: P. C. Burns, H. B. McMeal, W. H. McDonough, W. E. Doolittle, G. A. Briggs, J. P. Cracraft, S. A. Dinsmore. These will be in charge of the banquet, which will be an elaborate one, with all the trimmings that go to make an affair of this kind a complete success. The entertainment programme is not yet fully arranged, but the committee has assured TELEPHONY that it will be an elaborate one, and will have some pleasant surprises for the delegates.

James B. Hoge, president of the National association, has submitted the following:

"The National Independent Telephone Association of America will convene at the Auditorium Hotel in Chicago on Tuesday morning, June 20, at 9:45 o'clock, for the purpose of hearing the report of the committee on the matter of consolidation with the Inter-State Independent Telephone Association of America. This will give ample time in which to hear and ratify the report, so as to be in readiness to open the convention of the National-Interstate Telephone Association promptly at 10 o'clock a. m. It was thought wise to take this action in order to properly close the records of the National Independent Telephone Association of America."

In an interview with a representative of TELEPHONY Theodore Gary, president of the Interstate association, expressed himself as follows, in relation to the greater National-Interstate Telephone Association:

"The organization of the greatest telephone association in the history of the Independent movement is at hand. Preliminaries have been arranged by special committees appointed from each of the two leading old associations. That this association can be made a valuable adjunct to the operators, manufacturers and jobbers there can be no question. Whether it accomplishes the objects sought or not depends entirely upon these three interests. While the National-Interstate association will be purely an operators' association, the membership being representative, at the same time, the moral support of the allied interests must be in harmony with the association if it is to be a success.

"I strongly urge upon all interests the importance of giving the plan of a National organization a fair trial, by earnestly supporting it for at least three years. At the end of that time, if what has been accomplished is not satisfactory to the membership and all interests, it will be time to

PRELIMINARY PROGRAMME

Annual Convention of the National-Interstate Telephone Association, to be held at the Auditorium Hotel, Chicago, June 20–22, 1905.

MORNING SESSION—JUNE 20.

Meeting called to order at 10 o'clock.

Address of Welcome: MAYOR DUNNE of Chicago.

Response: BRECKENRIDGE JONES, of the Kinloch Telephone Company, St. Louis, Missouri.

Address: "The National-Interstate Telephone Association," JAMES B. HOGE, Cleveland, Ohio.

Address: "Ways and Means to Make Our Association a Success," THEODORE GARY, Macon, Missouri.

Appointment of Committees.

Adjournment for lunch.

AFTERNOON SESSION—JUNE 20.

Meeting called to order at 2:30 o'clock.

Roll call of states. (Each state has been requested to have some one respond for it. This member will be expected to give a talk of from three to five minutes on the telephone situation in his state.)

Paper: "Shall the Independent Telephone Companies Have an Insurance Company of Their Own?" JAMES S. BRAILEY, JR., Toledo, Ohio.

Paper: "Combined Telephony and Telegraphy," SAMUEL G. MCMEEN, Chicago.

Paper: "What Arrangement is Necessary Between the Operators and the Manufacturers to Protect Independent Companies?" THOMAS BROMLEY, Muncie, Indiana.

Paper: Response to Foregoing by a Member of the Manufacturers' Committee.

Adjournment for the day.

MORNING SESSION—JUNE 21.

Meeting called to order at 10 o'clock.

Paper: "Standard Toll Signs," L. L. C. BROOKS, St. Paul, Minnesota.

Report of Committees: Discussion of and action on same by convention.

Adjournment for lunch.

AFTERNOON SESSION—JUNE 21.

Meeting called to order at 2:30 o'clock.

There will be a few other papers (including one on "Telephone Securities"), which have not been fully decided upon.

Transaction of miscellaneous business.

Election of officers.

Adjournment.

JUNE 22—The entire day will be devoted to visiting and inspecting exhibits, and such entertainment as the manufacturers will tender the delegates, the whole to close with an elaborate banquet at the Auditorium in the evening. The entertainment committee has not yet announced its programme, but it is understood that it will have some jolly surprises for the delegates.

consider some other plan. In the meantime, let all keep sight of the main fact that *in organization there is strength.* The association can, if necessary, bring sufficient power and influence to bear to right any wrong threatening our interests by decision of courts or injustice of officials, whether municipal, state or national.

"Organization is the only way to form a complete toll line system that will furnish connections with every Independent telephone exchange in the United States. The main objects of the association should be kept before all:

"First—'Gather information and statistics of the Independent telephone business.' This will enable a story to be told in facts and figures that the greatest development made by any industry in the world is the Independent telephone movement.

"Second—'Promotion and development in territory not now developed, and protection of existing interests.' There is nothing to be added to this.

"Third—'Uniformity and standardization, and doing any and all other things that are to the best interest of the members of the association.' This covers the ground.

"The association will maintain permanent headquarters, to which all members of state and district associations in good standing with it shall have access, both in person and by mail. The location of this office and the men to properly fill the position created will be among the questions to be settled at the Chicago meeting.

"The consensus of the best telephone operators is that the association is organized on right lines, that the objects and aims laid down are correct, and that the organization is entitled to the best efforts and support of the entire Independent movement.

"While the association will be purely representative, it is expected that as many individual operators as can will be present. Let us have one strong central organization to which all interests may look for reliable information. The National-Interstate Independent Telephone Association covers the ground, and is the only association that has ever been planned to fill the new conditions that have grown out of this huge business. The greater organization is the result of necessity, and it is the natural result of a general demand for a strong central Independent telephone body."

President Hoge's sentiments in relation to the National-Interstate association and on the question of organization are familiar to every Independent. They have appeared in TELEPHONY on numerous occasions during the past year. At this time, however, it is appropriate that President Hoge should be heard from again. Here are some of his latest utterances:

"You are all aware that we have consolidated those two organizations—the Interstate Independent Telephone Association and the National Independent Telephone Association. Hereafter there will be but one association, the National-Interstate, and we want to make it one of the best associations in the country. There is no business I know of that offers such a great opportunity for co-operation or for community of interests as the telephone business, for we depend to a very great extent on the equipment and co-operation of our neighbors, and the toll line business is going to be developed so that it will be possible to talk at least 1,000 miles over Independent lines. The opposition has been talking about our development, trying to make people believe that whenever we could talk a thousand miles it would be something wonderful. We are going to reach that point this year.

"Organization is the watchword of the twentieth century. There never was a time in the world's history when the subject of organization received so much attention as at present. It is generally conceded that proper organization is a good thing, but that in some cases its privileges are abused. However, that does not condemn organizations any more than the fact that the daily violations of laws condemns the necessity of having national, state and municipal laws for the government of our people. The subject is one commanding the best thought and attention of Independent telephone people to-day. It is now about ten years since the first Independent telephone properties were put on an operating basis. Very few were put in successful operation until 1895; comparatively few until 1896 and 1897.

"The National Independent Telephone Association was organized in 1897, principally for the purpose of defending patent litigation that was then threatening the very foundation of the Independent movement. The way this association covered that field and protected the patents is now a matter of history and needs no explanation or defense. The Independent telephone movement has grown beyond all expectations.. The Bell company had controlled the telephone situation more than seventeen years and had less than 300,000 telephones in operation. When the basic patents expired the American people only needed to be allowed the privilege of using the telephone and applying it to their business and social life in order to appreciate its full value.

"During the past ten years the Independents have installed more than 4,000,000 telephones connected with their various systems throughout the United States. During the same time their competitors had many times doubled the number they had when the Independents were allowed to enter the field, so we find that the telephone growth to-day is greater than that of any of the other public-serving corporations. The result has been that the Independent telephone companies have extended their systems from county seat to county seat and from center to center, until to-day they are touching elbows with each other on practically every boundary line. Until the past three years they had but very limited long-distance service. To-day their long-distance service in many cases is equal to their competitor, and promises in a very short time to be in every way equal, if not superior, to their service.

"The Independent movement is made up largely of the most substantial and most active business interests in the country. The leaders of the movement have gone into the business from various other vocations, and the result has been that they have carried their former ideas as to bookkeeping, operating rules and regulations, from the banking, manufacturing, mercantile, transportation, gas and electric light business into the telephone business. It is important and necessary to standardize rules and regulations, forms of accounting, advertising methods, equipment and various other essentials, so that the single companies may be operated as a single property.

"It is no more necessary to consolidate these local exchange properties, in order to carry it out successfully, than it would be to consolidate all the steam railroads or electric railroads in the country, in order to operate them successfully on a uniform basis. Several years ago the steam railroads adopted the standard gauge of track, so that to-day every road in the United States has adopted the same. Locomotives and cars made in the various shops of this country are so thoroughly standardized that they can be operated successfully in trains with other cars and locomotives from one end of this country to the other. Brakes, couplings, etc., have been standardized so that there is no longer the necessity of telegraphing or writing to find out whether or not the equipment of this road or that road can be operated over the tracks of some other company.

"Rules and regulations governing the handling of passengers, baggage, etc., have all been standardized so that to-day through tickets are sold over the lines of the various companies, baggage and freight are billed through and rates are quoted from one distant point to another. Schedules have been arranged so that trains connect with each other at terminal or junction points. Time for operating

trains has been standardized, thus simplifying the matter of traveling, making it more convenient to the public and less annoying to the operating companies.

"During the past five or six months I have been in correspondence with the various officers of a number of state associations and find that in nearly every case they agree that the time is ripe for better organization. What we need to-day is uniformity of organization. There is no other business parallel to that of the Independent telephone companies.

"In conclusion I desire to urge the importance of proper organization. We must draw a line to perfect the Independent system, and then cut to that line; then the results will be most advantageous to all. First, it will improve and simplify the service which benefits the patrons. Second, it will reduce the operating and construction expenses to a minimum, give greater stability to the securities and be generally beneficial to all companies. There is room for two telephone systems, but not room for a third. With the proper organization on the part of the Independent companies, they will continue to be the stronger and will receive their full share of the business upon a fair and profitable basis."

TELEPHONE MYSTERY EASILY EXPLAINED.

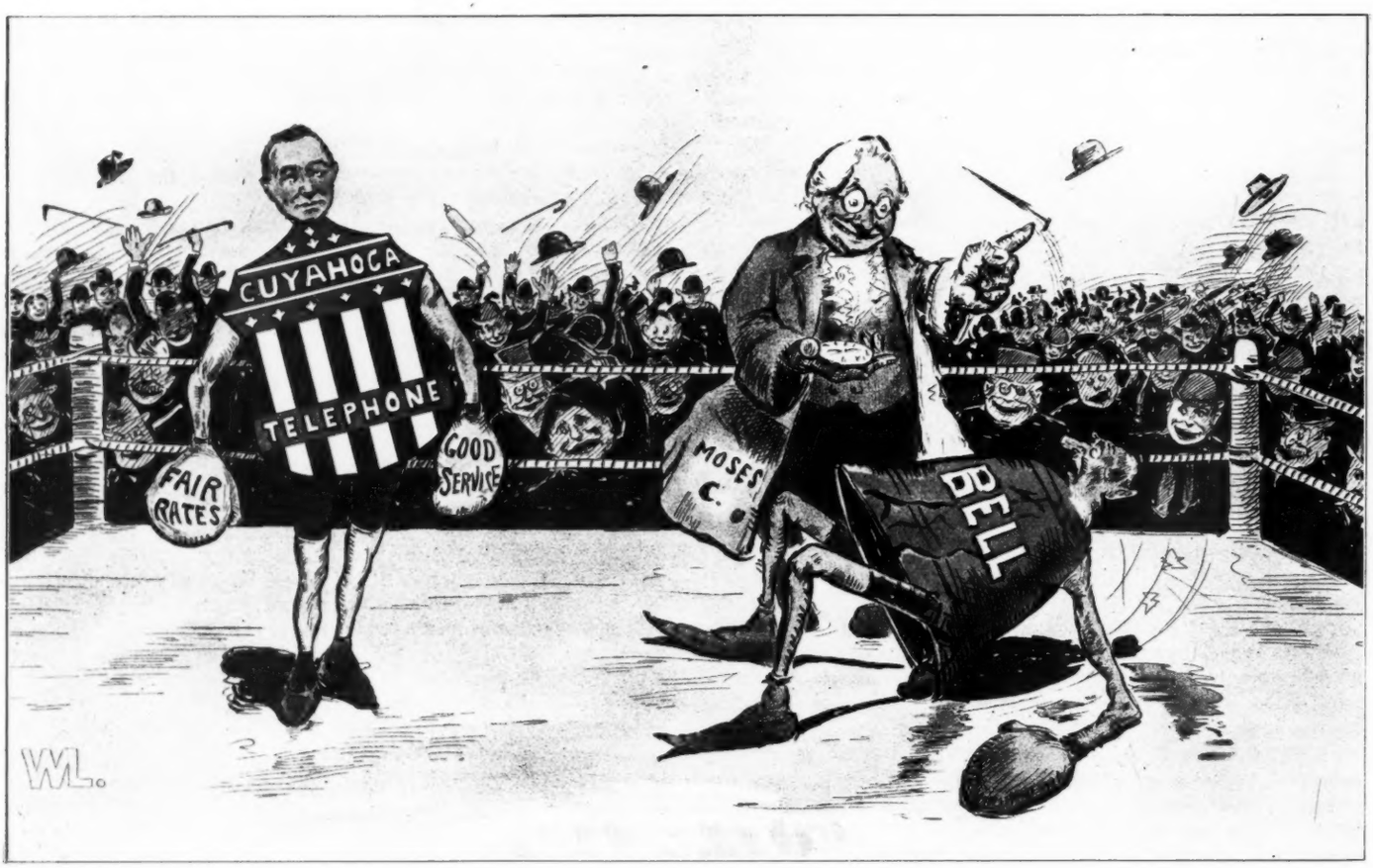
A reader of TELEPHONY residing at Munising, Michigan, sends in the following for publication:

"In a certain part of Michigan are two towns, which, for convenience, we will call Jonesville and Smithville, the former being the headquarters of a certain telephone company managed by Mr. Jones and the latter simply a toll station looked after by Mr. Smith. The two places are separated by dense woods and about four miles of No. 14 BB iron telephone wire. This line follows a rough stage road through the woods and, most of the way, is suspended upon trees; the last mile, however, is through a clearing, and small poles of various shapes and breeds are set along the side of the road bordering the fields, and, part of the way, following the barbed wire fences enclosing the fields.

"At a certain place, just on the outskirts of the village of Smithville is a house quite close to the road, with a wire fence in front. One day Mr. Smith came to the main office at Jonesville and informed Mr. Jones that the line passing this house had been broken and a piece of wire from the center of the span was gone, but the end from each pole had been carried to the fence and each attached to the top wire. Directly in front of the house was a small wooden gate with no wire connected across, but the line seemed to work perfectly when the gate was closed, but when open the line appeared to be open. Jones questioned Smith thoroughly, but he still stuck to his theory.

"The next day, the line working badly, and Jones having quite a curiosity to know the cause, he took a trip to Smithville to investigate. This is what he discovered: The line passing in front of the house was exactly as Smith said, and the line connected on each side also as he claimed, but Smith had failed to notice another fence passing around the back of the house and connected to the one in front, the top wire on one side simply touching that of the front fence when the gate was closed, and slacking away when the gate was open. Thus the mystery was solved and another case of wireless telephony received a fall."

The California legislature recently passed a law making it a felony to send a false message by telegraph or telephone, punishable by imprisonment in state's prison for as long a time as five years.



A DEAD RINGER.

One of a series of street car advertising cards, printed in colors, and used by the Cuyahoga Telephone Company of Cleveland, Ohio.

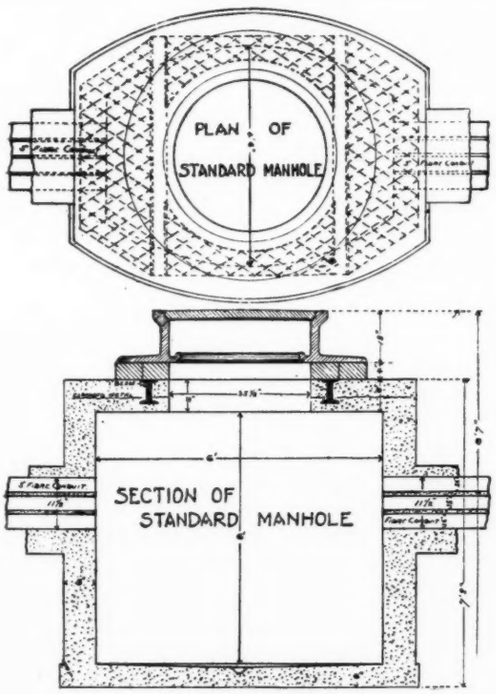
Telephone Construction Practice

H. J. MINHINNICK

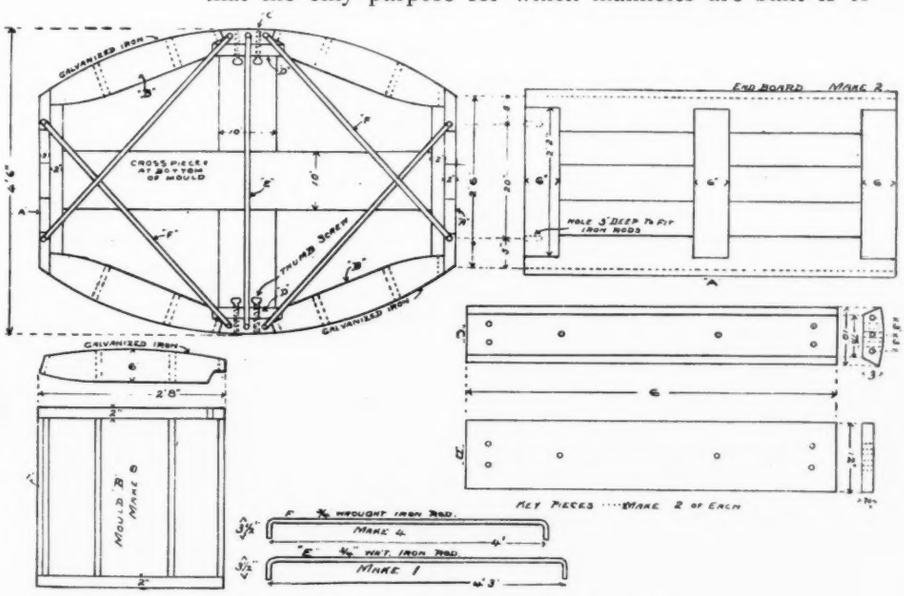
CHAPTER V.

MANHOLES.

WHEN discussing the question of subway surveys no special attention was paid to manhole location for the very good reason that, in nearly all cases, the manholes may be said to locate themselves, and it is rare, indeed, that there is any choice in the matter. The manner in which the streets and alleys are laid out must of necessity determine the positions of the manholes, and but few rules of universal application can be laid down. Of course, there must be a manhole at or near each distributing pole, and certainly one at each point where a branch line leaves the main lead. The greatest permissible distance between manholes is not to exceed 600 feet, and it is questionable if it is good engineering practice to attempt a pull of much over 500 feet, especially with heavy cables. If the writer were confronted with the problem of a 500-foot pull of a 400-pair cable he would unhesitatingly build an extra manhole and make an extra splice, and this notwithstanding the fact that such lengths of cable have often been successfully drawn in. When one considers that a cable of this size will weigh from seven pounds per foot upward, it is evident that a terrific strain must be put upon both core and sheath in making excessively long pulls and that there is considerable risk of damage, if not of absolute ruin, to the cable. The ordinary city block, however, is rarely more than 400 feet long, and this length can be drawn in with perfect safety. In all cases care should be taken to locate the manholes as far from the gutters as is convenient, so that the danger of flooding will be reduced to a minimum.



CONCRETE MANHOLE.



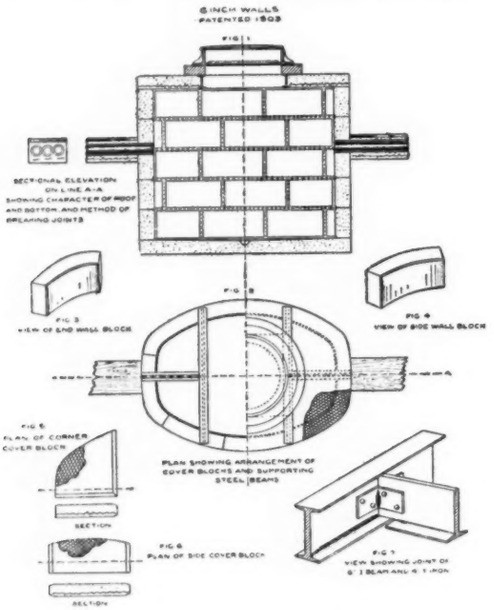
TEMPLETS FOR CONCRETE MANHOLE.

The manholes may be built either of brick, concrete or concrete blocks, as preferred, the former being the most commonly used material, and in many respects the best, for it is not often that a manhole can be built exactly to the size desired, especially in alleys already crowded with two or three sets of subways; and of the three forms of construction, brick is the only one that lends itself readily to changes. The concrete manholes are made by pouring concrete around wooden forms, faced with sheet iron, and the slightest change in the shape or size of the hole requires that new forms be made; the concrete blocks are open to the same objection, as they are designed to build only one particular manhole and cannot be readily varied. If, however, there is reasonable assurance that there will be room to build to a prescribed size and shape, either form of concrete construction may be adopted, and working drawings of both are here reproduced. As between the two, the concrete block possesses several points of considerable advantage, which, as stated by the patentees, the Subway Engineering and Construction Company of New York, are: rapidity of construction, uniformity of size, no expensive moulds or templets, and the fact that the street or alley can be opened for traffic in five hours after the excavation is ready. These advantages may also be claimed for brick construction and, so far as cost is concerned, there is little difference in the three methods.

Whatever material be adopted, it must be borne in mind that the only purpose for which manholes are built is to accommodate the cables, and this consideration must be paramount in their design. The larger the manhole the more room there will be for splicing and for proper arrangement of the cables, therefore, all manholes should be built as roomy as possible and should, above everything else, have ample head room so that the splicers will not be compelled to work in cramped and uncomfortable positions. The accompanying drawings show the standard manholes adopted by the writer's company, which are the result of much experiment and considerable attention to detail. As a general rule, the bottom of the pit should be at least two feet six inches in the clear below the bottom duct, and in holes which accommodate many cables three feet will be better.

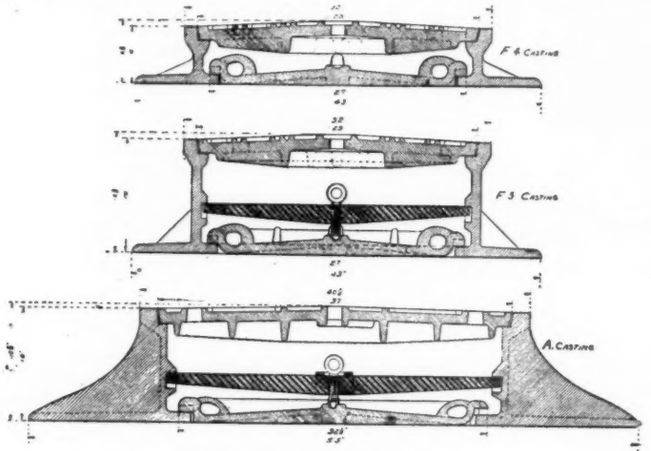
The walls are eight inches in thickness, laid up of hard burned brick with at least every fifth course headers. A very considerable saving may be effected in this matter of brick

by an understanding of the process of manufacture and the grades into which the product is divided. The makers sell "standard," or "kiln run" brick, which are suited for ordinary building purposes, but entirely too soft for manhole use; "selected sewers," which are harder burned, but perfectly straight, and "clinkers," or "arch brick," which are the hardest of all, but which are generally warped and frequently more or less cracked. The "standards" are from the outside of the kiln where the heat is least; the "selected sewers" from the inner portion where the heat is greater, but not sufficient to produce warping, and the "clinkers" from the arches where the heat is so great as to cause more or less distortion and cracking. The "selected sewers" are generally sold at an advance of from $1.50 to $2 per thousand over the "standards," while the "clinkers" can be bought, with all absolute culls thrown out, for about $2 per thousand less. This makes a difference of approximately $4 per thousand, and between the "clinkers" and "selected sewers" for manhole building the writer would unhesitatingly say that the former are preferable for the following reasons: (1) they are harder, (2) there are no bats, and (3) the warping is really an advantage in turning the curves of the walls.



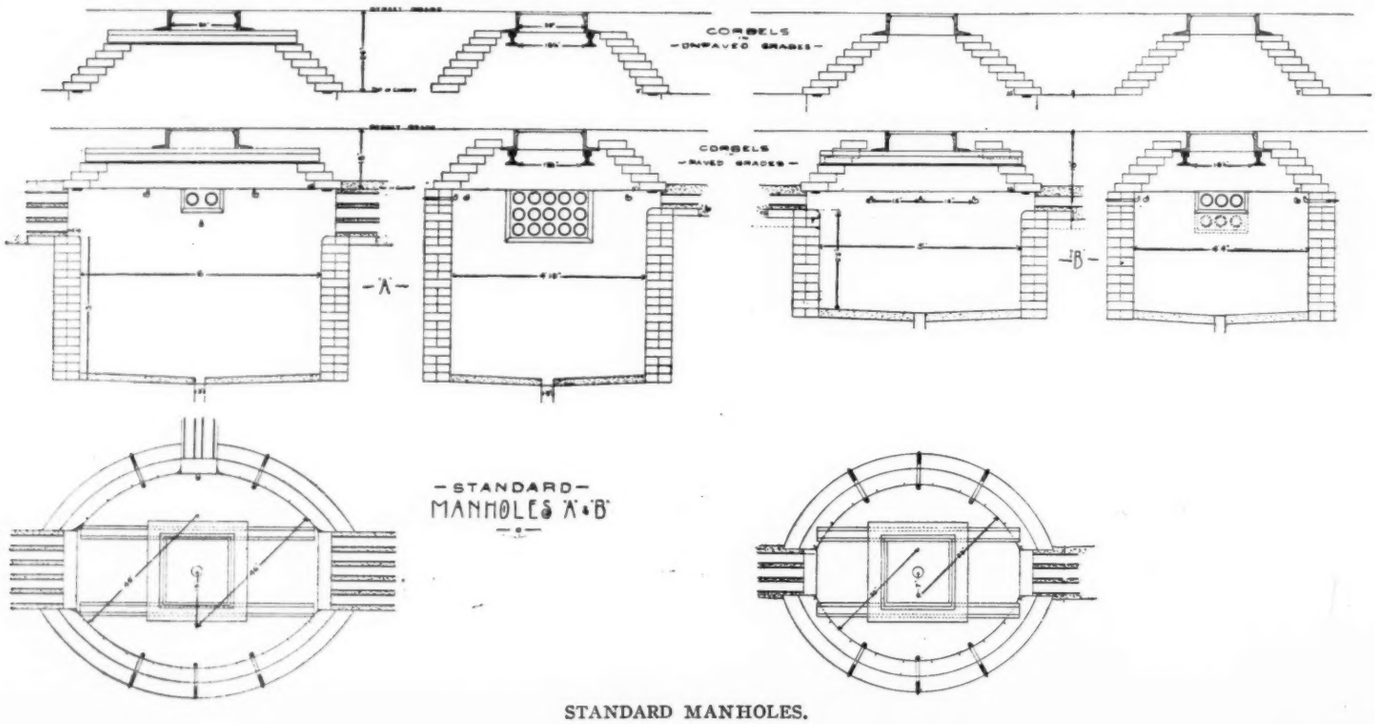
CONCRETE BLOCK MANHOLE.

The mortar used should be a good quality of cement mortar mixed about as follows: Sand, four parts; natural cement, two parts, or Portland cement, one part, and all joints should be "shoved," that is, a surplus of mortar should be placed on the lower course and the new brick pushed through it to place. This assures the complete filling of the spaces between the bricks. In addition, when a course is completed around the hole, it should be most thoroughly "chinked," so that every interstice may be completely filled with mortar.



THREE HEAVY BELL COVERS.

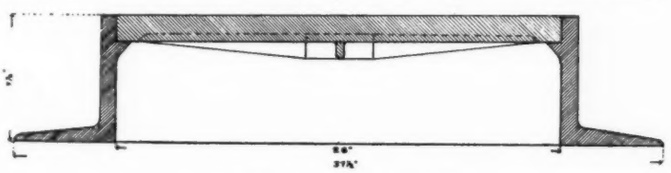
The corbel will be laid up entirely of header courses; it should not commence below the top of the ducts nor should the corbelling exceed two inches for each brick, or four inches for the complete course, i. e., two inches on a side. The ducts should enter the walls of the manhole about four inches and must be cut to form a perfectly flush face, which should be neatly pointed up with mortar. The illustrations show this better than any amount of letter-press could do. The duct entrances should be made of quarter-round brick,



STANDARD MANHOLES.

so as to afford an easy bend for the cables; these brick, which are commonly known as "bull noses," can be had for the same price as "standards," and make a very neat and workmanlike finish.

As a rule the corbel cannot be drawn in enough to receive the frame and the most efficient, as well as the cheapest, top is made by laying railroad iron across the last courses of brick. This may require either two, four or more irons, according to the amount of corbel and the size of the hole. In any case the two which support the frame and cover must be set first and as many more as necessary set at such intervals from these as will just allow a brick to be slipped between the web of the rails. The illustration shows two rails in position with a brick inserted. When the roof is made in this way there will still be an open space between the rails supporting the cover, which may be filled in by placing small "T" irons between the rails transversely and brick between the irons, or better, by a concrete slab. A sheet of No. 14 corrugated iron may be cut to slip between the rails to support the concrete, which should be of good quality and not less than five inches in thickness. The entire top can then be finished off with mortar or concrete and the sides of the corbel should be thoroughly plastered on the outside. As the walls rise the space outside them must be tamped solid, and too much care cannot be given to this matter, especially in paved streets or alleys. It is the writer's practice to use fine cinders for this purpose, instead of earth, as they can be tamped much more readily. If for any reason extremely



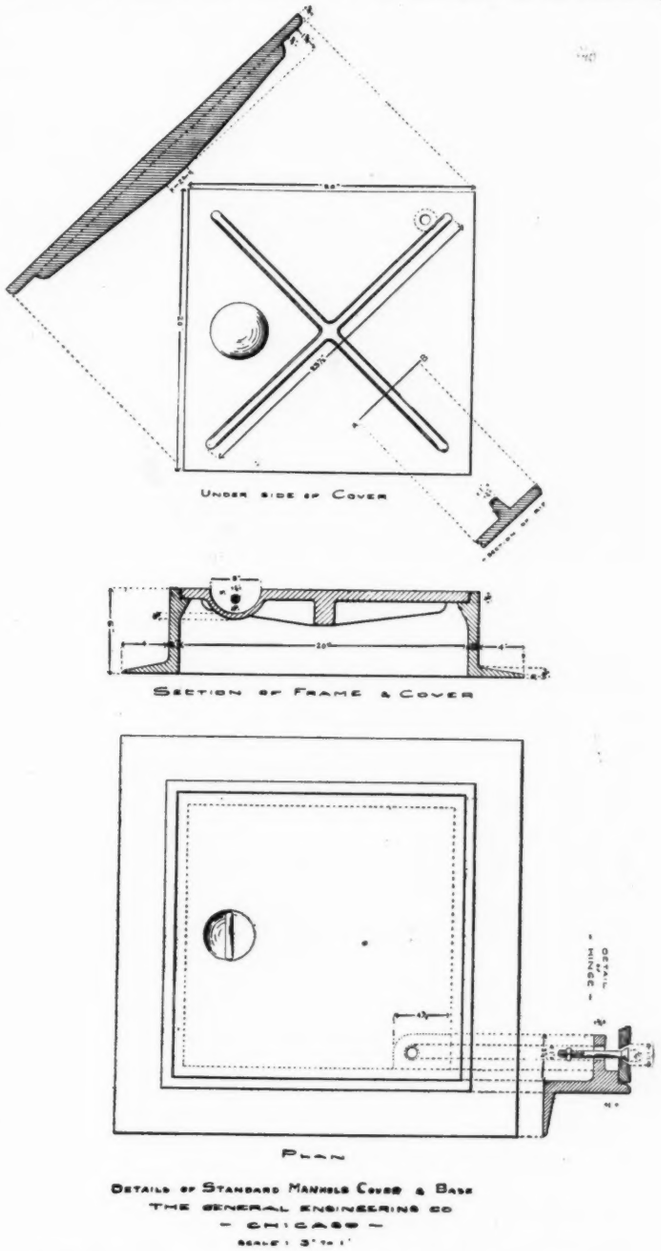
COMMON ROUND COVER.

heavy construction be desired or required the walls may be thirteen inches in thickness and a double course of rails laid on the top, one at right angles to the other, but, except in the case of exceptionally large manholes, this is rarely necessary.

The pit must be dug at least twenty inches larger each way than the inside of the manhole, thus allowing eight inches for each wall and two inches for filling. The mason should see that the bottom of the excavation is perfectly level before he commences work, and, to aid him in getting the first course properly laid, a wooden templet should be provided to give him the correct curves for his walls. This templet should cover exactly one-half of the bottom of the manhole, and as there are ordinarily but two sizes of manhole required there will be only two templets to make. Having obtained a perfectly level bottom the mason lays the templet with the straight side exactly in line with the center of the trench and places a course of headers around its periphery; turning it over he repeats the operation on the other side of the manhole and so completes his first course, after which he proceeds to lay up the walls in the usual way. The walls should be carried up truly perpendicular until the corbel is reached, and the level should be frequently applied to keep the courses horizontal. The walls should be fairly smooth on the inside and neatly pointed, and no careless or slip-shod work should be tolerated—in fact, as much care should be taken in building a manhole as in putting up the wall of a house.

As the top course is approached care must be taken to make sure that it is on the proper grade, and it will be found advisable to have the mason determine in advance just how many corbel courses he can lay and then (by varying the thickness of his mortar joints) so adjust matters that when the rails are laid across the last course and the manhole frame set on the rails, the top of the cover will be from one-half to three-quarters of an inch above the established grade of the pavement. An elevation so slight as this will not be noticeable when the pavement is relaid, and yet it will work wonders in keeping water out of the manhole.

The last step is the concreting of the bottom. In ordinary circumstances it is impossible to connect each manhole to a sewer, nor is there any particular reason for so doing, as water in the holes will not work any damage; if, however, a convenient sewer can be reached without too great expense it is most excellent practice to connect the manholes thereto by a three-inch drain pipe trapped in the manhole. The city ordinances invariably require this connection to be made by


Under side of Cover
Section of Frame & Cover
Plan
Details of Standard Manhole Cover & Base
The General Engineering Co
- Chicago -

DETAILS OF STANDARD MANHOLE COVER AND BASE.

a licensed plumber, who will attend to all the details of the work. A reasonably well fitting cover will allow very little water to enter the manhole, and to get rid of this leakage (which could not escape through a solid concrete floor) a four-inch drain pipe should be placed in the center of the bottom and extend down some three feet to form a "sink away." The floor of the manhole consists of four inches of concrete with a top dressing of at least one-half inch of mortar; this concrete should be tamped in such a way that it will drain from all directions into the sinkhole in the center, and the top dressing should be trowelled to a smooth face.

It is, of course, understood that when the manhole is built an opening will be left for the riser pipe or pipes which leave the hole, and, where possible, these pipes should be laid at the same time as the rest of the ducts. If, however, the distributing poles are not set, it will be necessary to block the opening till the riser can be laid to the pole. If multiple clay conduits be used it will be necessary to provide either iron pipe or some form of single duct for the risers, and if these are of any considerable length the latter will be found better

VIEW OF EXCHANGE MANHOLE.

and cheaper. The fibre conduit is especially well adapted to riser purposes, as the manufacturers furnish bends of different degrees and radii, which make the turn to the pole neatly and economically, whereas iron pipe is expensive and almost impossible to bend without buckling, and requires special cutting and threading tools for its installation.

It is common and very good practice to use second-hand boiler flues for risers, as these can be bought for a fraction of the cost of iron pipe and can be readily bent to the required curve at the pole by having the blacksmith fill them tightly with dry sand before heating. If it be necessary to use more than one length between the manhole and the pole the ends of the flues should be cut off square and great care taken to dress out all sharp burrs or edges which might damage the sheath of the cable; the joint can then be made by means of a simple ferrule, which should be about four inches long and made to fit the pipes very closely. If the fibre duct and bend be used the bend should be cut off at least four inches under the surface of the ground and an iron pipe or flue jointed to it, which iron pipe should extend not less than ten feet up the pole and be securely fastened thereto by iron straps or hooks. It would seem hardly necessary to say that the riser should be placed on the side of the pole lease exposed to injury from passing drays and wagons, and yet this simple precaution is too frequently neglected. It will greatly simplify the cable splicing if the riser entrance be located near the end of the manhole farthest from the exchange, so that both the main cable and the riser branch may run out of the splice side by side, and the cost of the few extra feet of duct or pipe which may be required to accomplish this result will be repaid many times over in the cable saved. There must, of course, be one riser for each cable running up the pole, and it is good practice to install extra pipes where there is any possibility of their being required subsequently, especially at terminal manholes where the cables join the aerial system. Whether duct or iron pipe be used, the risers should be encased in concrete and laid in every way as carefully as the balance of the conduits. The pipes up the pole should be neatly painted with graphite paint and the tops slightly flanged out so that no sharp edge will be left to cut or scratch the sheath of the cable.

The manhole frames and covers are of many designs and sizes, but it is questionable if there is anything gained by adopting the more elaborate forms. Some of the Bell companies use exceptionally large and heavy frames with air-tight double covers, one at the top, the other at the bottom of the frame, but this practice is undoubtedly bad unless some form of ventilation be provided, for unless some circulation of air be permitted gas is almost certain to collect in the ducts and manholes and there is a constant liability to dangerous and costly explosions. One of these frames is illustrated in the accompanying illustration. A good, heavy frame with an ordinarily well-fitted cover is all that the best practice requires and will answer every purpose. The most commonly used frame consists of a cylindrical casting heavily flanged at the bottom and recessed at the top to receive the cover, which is also cast and strongly reinforced to assure ample strength; the illustration shows the detail of a very satisfactory and efficient pattern. The chief objection to the round frame is that when drawing cables into ducts at the side of the run (and therefore off the center line of the frame) much difficulty is found in preventing the skid from slipping and twisting, and all sorts of blocking devices must be resorted to. This trouble would evidently be remedied by the use of a square frame, but here we meet the difficulty that a square cover may easily drop through a square hole and inflict all sorts of damage on the cables; this objection has been neatly overcome in the design shown in the illustration herewith. In this pattern a lug is cast in one corner of the frame, having a one-inch hole cored through it; a corresponding hole three-quarters of an inch in diameter is cored through a corner of the cover and a five-eighths inch carriage bolt, on which the cover turns as on a hinge, is passed through these holes. It is evident that the cover can by no possibility fall into the manhole and

VIEW OF EXCHANGE MANHOLE.

that all the advantages of the square shape are secured, with all chances of accident eliminated. It will be noticed that the bolt is considerable longer (two inches) than the distance between the top of the cover and the bottom of the lug, and also that the holes in both cover and lug are larger than the bolt; this is done to allow plenty of play, so there will be no binding when the cover is raised from the frame and swung to the side; the nut is prevented from jarring off by a split cotter pin passed through the bolt beneath it.

In replacing the pavement around a manhole the brick or stone should be so laid as to project about one-quarter of an inch above the edge of the cover, for the paving is bound to wear down in time, and if laid flush would soon leave the top of the frame above the surrounding grade and so subject to heavy lateral blows from the wheels of passing vehicles.

At the exchange it is customary, and, in fact, necessary, to install a special manhole, which is much larger than the others and connected to the building by a tunnel or passageway. It would, of course, be possible to build an ordinary manhole and run the cables into the building through ducts, but in this case each cable would have to be spliced in the hole, and the expense of these splices would more than offset the cost of the tunnel, besides which visitors to the exchange always like to see just how the cables get into the conduits, and it is much better to have them walk through a tunnel than climb down into the manhole.

The design of this exchange manhole may be as elaborate as desired and the mason should take extra pains to have his work neat and his walls true. As a rule the inside walls are faced with pressed brick and no corbel is used except enough to make a slight cornice around the hole. As to size 11x6 feet will afford ample room, and the tunnel into the building need not exceed three feet in width by six feet high. The roof of the manhole should receive especial care and be neatly plastered between the rails; a coat of graphite paint over the flanges of the latter will prevent rusting and add to the neat appearance of the job.

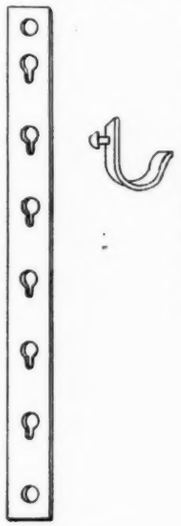
The three photographs reproduced are views of two exchange manholes and show entirely different locations—in one case the manhole lay directly beside the building, in the other some thirty feet of tunnel were required.

For supporting the cables around the walls of the manholes no appliance is more effective than the one illustrated, which is made by W. H. Anderson & Company of Detroit, Michigan, and also by Hallett & Company of Chicago. The hanger strips may be installed as soon as the

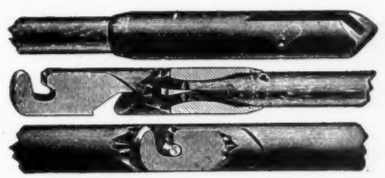
VIEW OF EXCHANGE MANHOLE.

manholes are built, and as their cost is trifling they may be ordered for the full duct capacity and only as many hooks used as are immediately necessary. Several other forms of hanger are shown in the catalogues of supply houses, but the one illustrated seems to be the most economical and effective of all, as well as the most easily applied. In the detail manhole drawings already referred to it will be noticed that four pole steps are shown inserted into the first corbel course; these are to suspend the hanger strips from and no bottom support is needed. Through the tunnel into the building these strips should be placed at intervals of not more than six feet in order that the cables may have ample support and be neatly racked into position.

When the conduits, manholes and risers are completely installed, the next and last operation is the rodding and cleaning of the ducts. For the former purpose two or three forms of wooden rods may be had. The writer must confess that he has never had entire satisfaction from any wooden rods he has used, and for several years he has preferred rods made from one-quarter inch gas pipe fitted with extra long couplings. As a matter of economy these cost less than twenty-five per cent of what is charged for a similar length in wood, and if any of the joints become worn or loose the pipe can be cut off and re-threaded at very small expense. It is doubtless true that the wooden rods can be coupled up more quickly than the iron ones, as the latter require the use of a pair of wrenches, but it must be remembered that coupling is required only once on the main line of ducts and once for each branch, as the rods are pushed ahead from manhole to



CABLE HANGER.



CONDUIT RODS.

manhole without uncoupling; however, with either form the procedure is identical. A pay-out reel carrying a coil of either No. 12 or No. 14 iron wire is stationed at the first manhole from the end of the subway; the wire is attached to one of the rods, which is pushed into a duct and succeeding rods coupled on until the wire reaches the end manhole, where it is removed from the rod and fastened securely to some convenient point in the manhole, such as one of the cable hangers, or to a wooden bar. The wire is then cut at the reel and that end is secured in the same way. The ends should by no means left free, as when the time comes to pull the cables it is very easy to get hold of the wrong fish-wire and pull it into the duct, thus necessitating rodding that duct again. The wire on the reel is now attached to what was the back end of the rods and the whole thing is pushed in the other direction, thus carrying the wire to the first manhole behind the reel. In other words, if we assume the manholes to be numbered serially from the end of the run, the reel will be placed at No. 2 and one of the ducts fished from No. 2 to No. 1 and then from No. 2 to No. 3, this process being repeated until as many ducts are wired as may be required. The reel is then moved to No. 4 and the same operations repeated, and so along till the main line of conduits is completed; the several branches are treated in the same way. Four men should easily rod from 8,000 to 15,000 feet per day, depending on how often they have to uncouple.

Unless there is reason to suspect (as by reason of heavy and continuous rains through the construction period) that the ducts contain considerable quantities of mud or dirt, it is usual to postpone any cleaning operations till the cables are pulled, but the better practice is to make absolutely sure that no obstructions exist at the time the rodding is done. It is frequently surprising to find how many sticks, pebbles and other small obstructions there are in a run of conduits, and this despite the greatest care; the workmen will often put pipes, tobacco and small tools in the ducts at the noon hour or at night and forget to remove them

when commencing work again, and of course the rods will pass these small obstacles without difficulty. At the same time one of these little things might work irreparable damage to the cable when it is being drawn in, and the small amount of time and labor necessary to assure a clear duct is well expended.

The writer's practice is to attach to the fish-wire, first, seven or eight feet of heavy two and a half inch chain; second, a wire brush flue-cleaner of the exact diameter of the duct, and third, a rubber or sole leather mandrel about one-eighth inch smaller than the duct, but of the same shape. The chain will loosen all mud, bits of mortar, etc., that may be in the duct; the brush will push ahead of it almost everything loosened by the chain, and the mandrel will catch what the brush misses. If the ducts be very muddy the chain alone may be drawn back and forth several times before the other tools are attached, care being taken to shake out the mud collected in the links after each pull. When this string of tools has been drawn through a duct we are absolutely sure that no obstructions exist which will hinder the passage of the cable, and can approach important operation without fear of damage or delay.

When the rodding and cleaning are completed the duct entrances should be securely closed with wooden plugs driven in so tightly that even if the manhole should fill with water they would remain in place; the manholes and drain pipes should be thoroughly cleaned out, the risers plugged at the outer end and every cover carefully inspected to see that it fits closely and has not become damaged in any way. These precautions being duly observed we may safely dismiss the subway system from further consideration till we are ready to install the cables.

BIG TELEPHONE DEAL CONSUMMATED IN BUFFALO.

One of the largest and most important telephone transactions in Independent circles in recent years was recently completed in New York state, when the controlling interest in the Frontier Telephone Company of Buffalo passed, by purchase, to the Consolidated Telephone Company of that city. The Consolidated Telephone Company, with a capital stock of $10,000,000, owns and controls the Inter-Ocean Telephone and Telegraph Company, with a capitalization of $2,000,000, and some fifty other important Independent telephone companies in that section of the state, and is one of the most progressive Independent companies in the country.

When questioned as to the benefits to the telephone companies interested, and the general public at large, by this deal, B. G. Hubbell, president of the Consolidated Telephone Company, said:

"The interests brought together through this transaction have produced a happy combination, which will greatly benefit the general public as well as the parties interested. The Consolidated Telephone Company, through its control of the Inter-Ocean Telephone & Telegraph Company, the long-distance telephone organization for the Independent interests of New York state, and its control of the Independent telephone business in all sections of this state and adjoining states, either by ownership of important exchanges or by exclusive contracts for connection with other exchanges and toll lines, occupies a position that will be of great benefit to the Frontier Telephone Company of this city, while on the other hand, it is conceded that Buffalo occupies the strategic telephone position of this section of the country, and the Consolidated company and its affiliated interests are, of course, to be congratulated upon gaining control of the Independent telephone business in Buffalo.

"The Frontier Telephone Company's switchboard has the largest multiple capacity of any switchboard in the United States; its underground work is extensive and extremely well constructed and provides for the largest possible ultimate development; its apparatus and service is excellent, and everything has been done to make an extensive and permanent foundation for this most progressive institution. In the early days of competition in the telephone business, the business man and the telephone-talking public were apt to question the economy and necessity for two telephone companies, but to-day the most prejudiced will be willing to admit that telephone competition has produced wonderful results in this city, as well as all other sections of this country.

"Through the competition afforded by the Frontier company, the class of service has been improved over 1,000 per cent or more; the number of subscribers to be reached has multiplied over five times the number prior to competition, and a business man can now have the service of both telephone companies, reaching over 25,000 subscribers in this city, for actually less money than he was forced to pay for connections with less than 5,000 telephones prior to the organization of the Frontier company. The public is, in a great measure, partner with the Frontier company in this work of establishing and maintaining efficient and extensive telephone service at reasonable rates and I doubt if any other institution has ever been able, through competition, to afford the public such pronounced increased facilities and benefits at so slight an expense."

The Consolidated is a holding company, and the addition of the Frontier company to its already large telephone holdings gives it, practically, control of the Independent telephone business of central and western New York, and makes it, probably, the largest Independent telephone company in the United States.

The Consolidated Telephone Company controls the Inter-Ocean Telephone and Telegraph Company, operating in the neighborhood of 1,500 miles of toll lines, with more than 10,000 miles of long-distance telephone wires, and connecting over 75,000 Independent telephones in one system, embracing all parts of New York state, as far east as Syracuse and Binghamton, and, through its allied interests, as far east as Albany. The Inter-Ocean company also connects with Cleveland, Columbus, Dayton, Indianapolis, Erie, Philadelphia and all other important places in Pennsylvania, Ohio and Indiana, through Independent long-distance telephone companies operating in these states, with which the Inter-Ocean company has rights for an interchange of long-distance telephone business.

The Frontier Telephone Company has been in operation about two years. It will be greatly benefited by having associated with it an organization controlling so many telephone properties tributary to Buffalo and the Consolidated Telephone Company and its subsidiary telephone exchanges, particularly the Inter-Ocean Telephone and Telegraph Company, will be largely benefited by controlling the Independent telephone business in so important a place as Buffalo, it being conceded that this city occupies the strategic position in telephone matters in central and western New York.

WIRELESS TELEGRAPHY AT PURDUE.

Wireless telegraph experiments with trains will be tried at Purdue University at Lafayette, Indiana. The electrical engineering building commands a view of long stretches of the Monon, Wabash, Big Four and other railroads, and instruments will be placed on various trains for testing purposes. It is believed by Prof. Kelsey of Purdue that difficulties encountered in previous tests have been overcome. It is the intention of the university to conduct a series of tests to the end that a receiver may be placed in the cab of the engine, within reach of the engineer, from which he may take his running orders from the dispatcher without stopping his train.

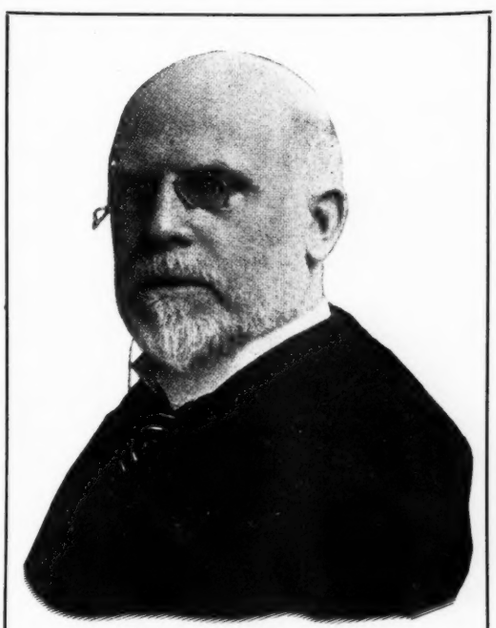
Anniversary Telephone Dinner

Given by Indianapolis Independent Telephone Companies

THE telephone dinner given by the Indianapolis Telephone Company and the New Long-Distance Telephone Company at the German House, Indianapolis, Wednesday evening, May 10, to the Independent telephone companies of Indiana, was largely attended by Independent telephone people from all parts of the state. Men prominent in all walks of life and various city and state officials joined with the telephone men in making merry over the success that has marked the Independent movement. Representative business men from distant cities and adjoining states were also present to offer their congratulations and good wishes. Covers were laid for 500. From the time when the reception rooms opened, at 5:30 p. m., until dinner was called, at 7 p. m., there was much handshaking, renewal of acquaintance and mutual congratulations on the phenomenal success of the Independent movement in Indiana. The officials of the two companies giving the dinner busied themselves to further the enjoyment of their guests. The dinner is said to have been one of the finest ever served in Indianapolis.

With a telephone beside his place, Hon. S. P. Sheerin, president of the Indianapolis and New Long-Distance Telephone Companies, acted as toastmaster, introducing each speaker in a few well chosen words. The responses that followed showed that the men who make a business of talking over wires are also competent of talking over coffee cups.

In calling the diners to order Mr. Sheerin gave a short history of the Independent movement and of the local companies. He said he did not want to abuse or boast, but merely to give a modest expression of some interesting facts. Thereupon he presented an array of figures which tended to show phenomenal growth.



S. P. SHEERIN.

Hon. John W. Holtzman, mayor of Indianapolis, in his address of welcome, congratulated the hosts and guests on their industrial achievement, and said that "Indianapolis the beautiful" was proud to greet them on this occasion. He referred to the fact that this was the sixth anniversary of the opening of the lines of these two companies for business, and said that in the beginning of the movement he had had great doubts as to the success of the enterprise. "I want to congratulate you," he said, "upon the wonderful showing which this body of energetic men has made. The figures on the extent of the growth would be surprising to anyone not familiar with the subject. I find that these companies are managed by home people—Indiana people—who own the property. Especially do I congratulate both companies upon the ability as foreshown in the personnel of their organization. I have known Hon. S. P. Sheerin, president of the Indianapolis Telephone Company and the New Long-Distance Telephone Company, for many years and know him to be a man of unquestionable integrity and honor, and successful in all business enterprises in which he has been engaged. He has never failed to show great organizing and executive ability."

In the absence of Alfred F. Potts, president of the Commercial club, Hon. John W. Kern, vice-president of the club, delivered an address on "What the Independent Telephone Movement Has Done for Indianapolis." He said he was city attorney when the New Long-Distance Telephone Company applied for a franchise and had misgivings that this company, notwithstanding the merit of its object, might fall a prey to its competitor. Within six years the infant has grown, until, if either must succumb to the other, it is apparent that the one to fall must be the Bell company. "The showing now is 12,000 Independent telephones in Indianapolis to the Bell company's 6,000; and, within a radius of fifty miles of the capital city, where the Bell company has 11,000 telephones, the Indianapolis company has 62,000! In Indiana the Bell company has 25,000 telephones, the Independents, 170,000. In seven years, from there being one telephone to every 250 inhabitants of the state, there are to-day one to every sixteen inhabitants! There are now 30,000 telephones in homes of farmers, and seven years ago there was not one farm telephone."

Mr. Kern made some facetious remarks about the facility with which the housewife could now increase the extent of her purchases over the telephone and order anything she may have forgotten at the store, and there was no appeal for redress on the part of the man of the house except to the head of the disbursing department of the home. It was not necessary now for her to crawl through the back fence or to go several squares to communicate with her lady friends. If she had forgotten anything in her curtain lecture she could call up her husband and recite the additional part. The telephone brings the tradesman and consumer nearer together, the people of town and country nearer together, and neighbor and neighbor nearer together. As home and office are brought closer together, men's minds are kept in closer touch with the home and are benefited.

Col. C. D. Powers of the Louisville (Ky.) Home Telephone Company, who was down on the programme to respond to the toast, "How We Do Things in Kentucky," was unable to be present on account of illness in his family. A letter of regret from Col. Powers was read by Merle N. A. Walker, Probate Commissioner of Marion county.

William Moellering, secretary of the Home Telephone & Telegraph Company and Independent Long-Distance Telephone and Telegraph Company of Ft. Wayne, was not able to be present and an article from him on the subject, "Why Our Own People Buy and Hold Our Telephone Stocks and Bonds," was read by Hon. Samuel Foster of Ft. Wayne. It follows in full:

Why our own people buy and hold our telephone stocks and bonds:

First—Because the investment is of a safe and profitable character.

Second—Because they see it grow in value.

Third—Because it is a home enterprise.

Ninety per cent of all stock and bonds issued by the Home Telephone and Telegraph Company of Ft. Wayne, as well as of the stock of the National Telephone and Telegraph Company—the securities of the two representing a total par value of $750,000—are held in Ft. Wayne; the other ten per cent was allowed to go elsewhere merely to emphasize the fact that our people are not monopolistic. Both companies were organized in 1896—the Home company to operate in Ft. Wayne, the National company to build and operate toll lines and exchanges at points along the Home company's lines.

The original capital required was subscribed by fifty men, representing almost every profession and mercantile line. As the business of each company enlarged and required more capital the original stockholders readily responded and new stockholders were added, and to-day the securities are distributed among 250 of our citizens, none of whom is willing to part with his holdings, because

First—They have received regular returns on the investment.

Second—They have seen the business grow uninterruptedly year by year.

Third—They are daily confronted with ample evidence of the permanent character of the enterprise.

Fourth—The management of the business rests in their hands.

But they have benefitted in other directions. They are paying no more for service over telephones in both their place of business and residence than they formerly paid for service over one telephone. They now reach all parts of the city and country districts, and every business house in the city is at their call. In the past they were able to communicate with scarcely more than one out of ten business firms, or with any residence beyond one-half mile from the central office. To-day every hamlet, village or town, formerly isolated, is in touch with them, and rates are lower than before.

The quality of the service is more perfect than of old and the wants of the patrons now receive quick attention. The good will of the public is essential to the success of any telephone company. Fair treatment wins and keeps that good will.

The Home Telephone Company counts 3,500 subscribers and is adding 500 more each year. The plant is modern and up to date and has an extensive underground system. It owns the new and well located buildings it occupies, which were built and arranged by the company to meet its requirements.

Based on the old Bell rates, the company saves to the people of Ft. Wayne more than $50,000 a year, and the privileges accruing to the city itself add several thousand dollars additional. The National company owns 1,000 miles of toll lines and operates in the states of Indiana, Michigan and Ohio, with local exchanges in the two first mentioned states. It has done much to open telephone communication, particularly throughout northern Indiana, and to connect eastern Indiana with western Ohio. It is closely associated with the Home Telephone Company of Ft. Wayne and is in high favor with local investors. Ft. Wayne people think sufficiently well of Independent telephone securities to be liberal purchasers of the bonds and stocks of outside companies; in fact, it was largely Ft. Wayne capital which built Independent systems in South Bend, Logansport, Muncie, Elwood, Anderson and other Indiana cities.

We have as a citizen one of the most successful western telephone promoters, George W. Beers, who has done much to establish Independent telephone exchanges in Indiana and thus to strengthen the general situation throughout the state.

Ft. Wayne people are also proud to own as a citizen the best—the very best—legal exponent on telephony, a gentleman who time and again has successfully fought the legal battles of the Independents in our highest courts, to whom the Independent companies owe an everlasting debt of gratitude—Judge Robert S. Taylor.

Referring again to the reason why local telephone securities are largely held at home—the paramount reason manifestly is, because years of experience have proven that the securities of well managed Independent telephone companies are high grade, sound, safe and profitable.

Yes, I Hear the Music. Protection. Count on me. Send everything. Carriage? Corn, 49½c. Best on the Market.

CARICATURES APPEARING ON PROGRAMME AND MENU CARD AT INDIANAPOLIS TELEPHONE DINNER.

J. D. Ware, secretary of the Michigan Independent Telephone Association, took the place of Breckenridge Jones of St. Louis, speaking upon the topic, "The Independent Telephone as a Commercial Factor." He said that, whereas the securities of the Independent companies were treated with suspicion a few years ago, they were now regarded by bankers and financiers with favor. He spoke of the saving made by the telephone system for calls in large mercantile establishments, hotels, etc. A smaller per cent of risk existed in the telephone business than in any other active industrial line.

James B. Hoge of Cleveland, president of the National Inter-State Independent Telephone Association, spoke on the theme, "The Necessity for State and National Organization." He said that after eighteen years of monopoly there were in 1893, only 300,000 telephones in use—one for every 216 inhabitants—at $30 per instrument. In 1895 the basic Bell patents expired. Now there are fifteen times as many telephones in the United States as there were in 1903; in Indiana thirty times as many, or one to every twelve of population. The national plan of organization is on the same order as that of federal or state government. The opposition is scheming to break the ranks of the Independents, so the most thorough organization along aggressive lines should be effected. Standardization, as with railroads, is necessary. He urged the Indiana Independents to send a full quota of delegates to the National convention at Chicago, June 20, 21 and 22.

Judge Robert S. Taylor of Ft. Wayne was absent and a letter from him was read by Charles R. Williams of the Indianapolis News. In this letter he said that though the Bell company held its fundamental patents until their legal limitation, thereby making it exceedingly costly to the people, when it attempted to retain its hold through the Berliner patents, the courts terminated these and the field was open to free competition along the most fundamental lines. The entry of the Independents stimulated invention to the highest degree. Competition has brought improved service. He wrote, "I think there is nothing of importance now threatening the growth and success of Independent telephony. I think we are near the end of litigation that will have in it any element of injury to public interests. Three or four suits now pending will have to be tried pretty soon or they will survive the patents on which they are brought. These are all that threaten the continuance of untrammled telephone service to the people. But the art is now secure in its ability to serve the public interest without the burden of any fundamental monopoly."

Jesse W. Weik, president of the Greencastle Telephone Company, amused the audience by a series of humorous remarks. In the more serious part of his address he spoke of the improvements that had been made in telephones during the last few years, and claimed that Daniel Drawbaugh, the man who gave the instrument its name, was a real inventor.

B. G. Hubbell of Buffalo, president of the Consolidated Telephone Company, speaking on "A Message from New

York," said that in his state the Independent movement was watched with some degree of suspicion as to its ultimate outcome six years ago, but that, after the New York people had found it was succeeding in other localities and that the investments in Independent companies were proving profitable, they had taken up the matter with vim and vigor, and the only menace in his state at present was that the confidence of capital might be too great and that there might be over-production. Within three years $4,500,000 had been invested by the Consolidated Telephone Company and $15,000,000 by the Independents of New York state. The Consolidated is now making extensions at the rate of $1,000,000 a year. In Buffalo within a year and a half the Independent company had acquired 10,000 subscribers, the Bell now having 15,000. As many subscribers had been gotten by the Independents within this limited time as it had taken the Bell twenty years to get. Fifty plants installed by the Consolidated were free from debt, except their bonds, which were rated highly. There are in New York state 600 Independent exchanges serving 150,000 subscribers.

M. F. Mahoney of Logansport was unable to be present and a letter of regret from him was read by President Sheerin.

Hon. E. B. Fisher, ex-mayor of Grand Rapids, Michigan, and president of the Michigan Independent Telephone Association, spoke upon the subject, "A Few of the Things Michigan Has Accomplished, With Some Hints as to What She Has in Mind." He referred to the letter of regret from Judge R. S. Taylor, read by Charles R. Williams of the Indianapolis News, and spoke of Judge Taylor having been a tower of strength to the Independents in patent litigation. He said that the Bell company would have succeeded in perpetuating a monopoly of its basic patents until 1909 had it not been for the activity of S. P. Sheerin and Hugh Dougherty of Indiana, and of James B. Hoge of Cleveland, in organizing the contest against the claims of the Bell company in the Berliner patents. He said that the Independent system had made great growth in Michigan and especially in the Lower Peninsula. As a result of the Independent campaign there was one telephone to every 7½ of population in the Lower Peninsula there being nothing like it elsewhere that he knew of. He explained the State Traffic Association and clearing house system of his state. Such associations were necessary to correct inequalities in service and rates and to see that every mile of toll line was given its fair share. Companies that would not settle were disciplined. The Ohio plan of organization had been substantially adopted in Michigan. The Michigan people were more intimate with those of Indiana than with those of any other state. He advocated yet closer relations between the people of the In-Independent movement in both states.

"The Independent Movement—a Blessing and a Hope tc the Inventor and the Student of Electrical Technology," was the subject of the address of Thomas D. Sheerin of the senior class of Purdue University, Lafayette, a son of S. P. Sheerin, and whom his father introduced as "the kid from Purdue." He said:

The college trained engineer, just emerging from university life and nibbling for the first time in the broad, green pastures of opportunity, cannot fail to be pleased at the prospect which presents itself. On every hand he is assured that there is a future—and a bright future—in store for him. He is invited to work for our larger companies, on terms which, if not flattering, are, at least, attractive to him. His prospective employers offer to place in his way every opportunity to learn. In short, he is in demand. Then, casting about him, as any man must do when he finds a choice of environment open to him, it is not surprising that his eye rests with favor upon the Independent telephone field. Especially does he enjoy the prospect if he has been trained in telephony. For these are some of the advantages which the Independent field offers:

(1) The greatest possibilities of advancement to be found in our American industries.

(2) The chance to work, and, perhaps, to fight a little, for the great American doctrine of fair play.

(3) The chance to work in a corps of employés whose personnel is of a high order of excellence, whose individual members are deeply interested in the success of the entire movement.

American telephony, as has been frequently said before, is still in the early stages of its development. Yet it has been promised, with every indication of fulfillment, that before many years our telephone industries will be second in importance only to our railroads. Even now they are growing with wonderful rapidity. New exchanges are being projected almost daily, and old ones are being enlarged. The country is being wound closer and closer within a perfect network of long-distance lines, until it is scarcely too much to hope that, within a comparatively short time, every man, woman, and child in the United States will be within the reach of good telephone service.

Again, the Bell telephone company, one time a monopoly, latterly a monster fighting for the bare subsistence necessary to its huge frame, did not play fair. It sought to limit its operations to a small area of high productivity. Its methods were selfish, unsatisfactory, and (it is needless to say) unpopular. The public was patient, but the worm turned, and, once turned, has been fighting like a bulldog ever since. Therefore, because this movement had its birth in the rebellion of the consumer, it has been marked throughout by the warm devotion of its adherents. It has been fostered, nurtured, and managed by owners and not by employés, and has thrived under a loyalty greater than salary alone can excite.

To the student also comes the consideration that the Independent movement is responsible for practically all the telephonic education which is available to-day. Publicity was never any part of the policy of the Bell monopoly. Students and men with special training it needed, of course, but only in a relatively small measure. It is with the advent of the Independents that the possibility of investigating the subject thoroughly has come. At least one of our universities has established a course in telephonic engineering, and rumor says that the example will be followed shortly by several others. From a scientific standpoint, then, the Independent owners have been of service, and the students who are perfecting themselves along telephone lines are likely to have long memories. The telephone business, in turn, cannot fail to be benefited by this annual addition of workers familiar with every phase of telephone science.

That the inventor is also to come in for his share of good things under the new regime is evidenced by the fact that the present activity in the business does not admit of patents being bought and pigeonholed. Our present Independent telephone apparatus is the product of invention purely, and could never have assumed its present position of importance without the stimulus of Independent operation.

In short, the development of the art of telephony has gone hand in hand with the progress of the Independent operator. Energy and ambition have been put at a premium, and investigation and invention have alike been encouraged. No one has profited more by the Independent movement than have the student and the inventor.

S. P. Sheerin, speaking of this being the sixth anniversary of the opening of the Indianapolis and New Long-Distance Telephone Companies for business, said that he and his associates entered this work because they believed it a good investment. The Central Union, prosperous and free from debt eight years ago, had spent money fighting the Independents which should have been put into improvement of service, until it now owes at least $12,000,000 and has paid no dividends for six years. In South Bend, Logansport, Muncie, Frankfort, Elwood and Noblesville the Central Union bought up the original Independent telephone companies. Local enterprise later installed superior and better paying Independent plants. Such would be the universal rule in Indiana. There are six Independent telephones for every one of the Central Union in Indiana. The New Long-Distance is the spinal column of the Independent system of the state. Of the $8,000,000 invested in Independent telephony in Indiana ninety per cent is from people within the state. The telephone will never go out of the household any more than the clock. Buying equipment in an open market and not from an inside ring, the Independent need not fear competition. Future inventions will cheapen operation. Let the people know your business. An investment in a good Indiana telephone plant, honestly and intelligently constructed and managed, is better than eight out of ten investments offered to the farmer and wage earner. Mr. Sheerin regretted that a special toast acknowledging the indebtedness of the Independent telephone interests to the press of Indiana for its assistance in the general movement in the

state ever since the movement was started had not been offered.

The banquet closed with the playing of "America" by the orchestra, the national hymn being sung by guests and hosts standing.

The menu was a tempting and elaborate one, as the following will show:

Cream of New Asparagus.

Celery. Olives. Radishes.
Baked White Fish, Italienne. Bordure of Potatoes.
Tenderloin of Beef, Jardiniere. Potatoes, rissole.

Orange Ice.

Roast Spring Chicken, au Cresson. Lettuce and Tomato Salad.

Neapolitan Ice Cream.
Assorted Cakes.

Roquefort and Neufchatel Cheese. Crackers.

Coffee.

Wine. Champagne.

Cigars.

During the course of the dinner the orchestra played the following selections:

March, "Telephone;" selection from "Prince of Pilsen;" gavotte, "Pretty as a Picture;" march, "Alexander;" overture, "Crown of Diamonds;" selection from "The Sho Gun;" waltz, "Love's Lottery;" romance for trombone; medley overture, Von Tilzer's latest; selection from "The Maid and the Mummy;" march, "Back to Baltimore;" selection, "Dark Man with a Bundle;" selection from "Babes in Toyland;" march, "Prince Charming;" gallop, "Long-Distance."

The menu card and programme of toasts was handsomely gotten up. Scattered throughout the pages were the numerous clever telephone sketches which accompany this article, and on the back of the cover appeared the following verse:

"In fortune and in fame we're bound,
By stronger links than steel;
And neither can be safe nor sound,
But in the other's weal."

The dinner was a pronounced and enjoyable success "from soup to nuts," furnishing a rare treat for the guests and proving the hosts to be past masters in the art of entertaining. Congratulations are due those having the delightful affair in charge.

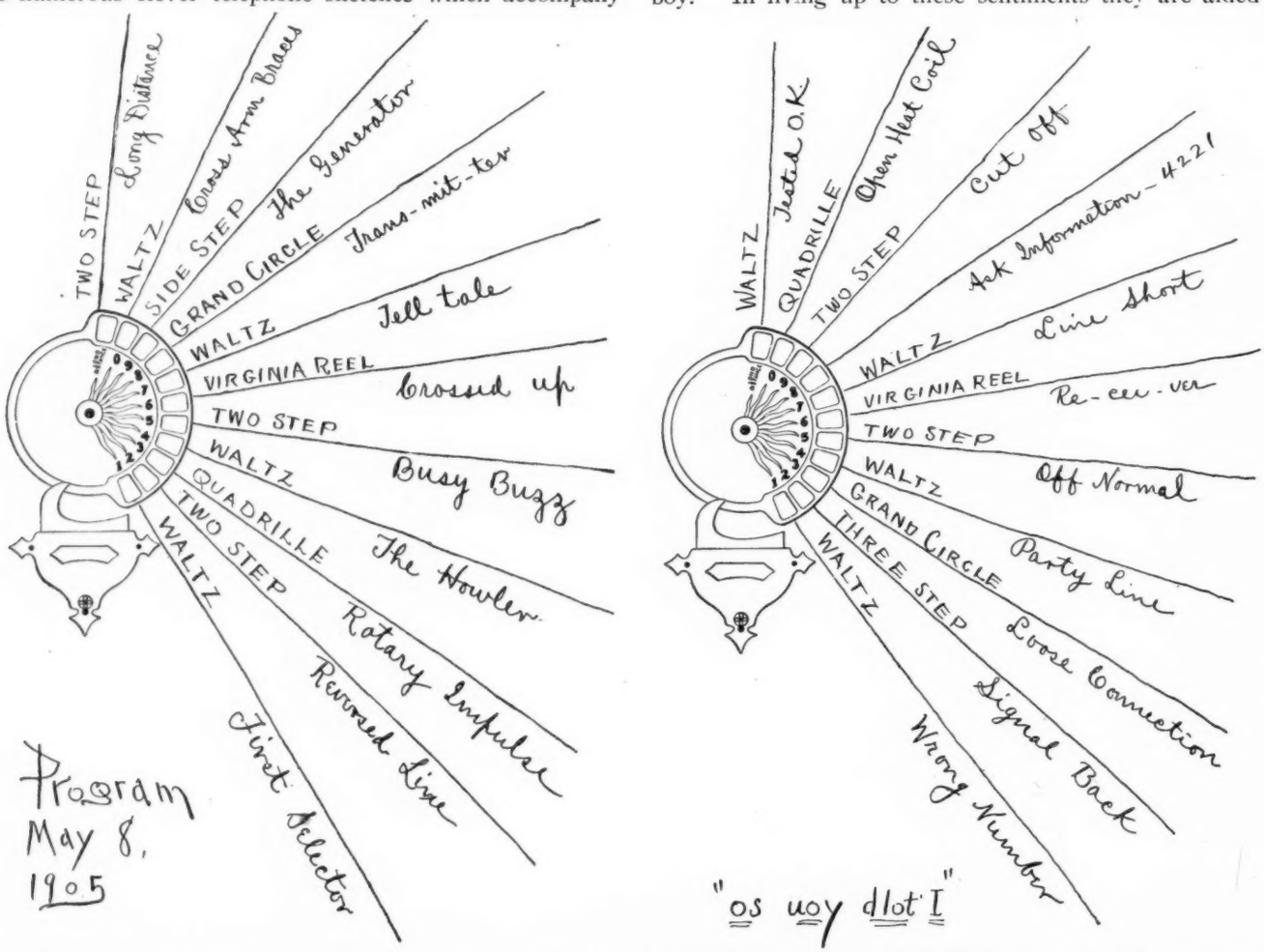
The day after the banquet the following editorial appeared in the Indianapolis News, reflecting the sentiments of the people of that city toward Mr. Sheerin and the Indianapolis Independent telephone companies:

The Independent telephone people celebrated the sixth anniversary of their Indianapolis advent with feasting and speeches last night. They had a most marvelous tale of rapid development and public service to recount. They have won success here by meriting it. Mr. S. P. Sheerin, who has been the active directing force in the great enterprise, received, last night, congratulations and commendation (as he richly deserved), which, expressed as they were with evident sincerity by those that really know of his achievement, must have been most gratifying to him. May he live long and prosper!

* * *

EMPLOYES OF CITIZENS' TELEPHONE COMPANY OF GRAND RAPIDS GIVE MAY PARTY.

While the numerous employes of the Citizens' Telephone Company of Grand Rapids, Michigan, are firm believers in the adage, "Business before pleasure," and regulate their daily conduct along that line, they also are as firmly of the opinion that "All work and no play makes Jack a dull boy." In living up to these sentiments they are aided by



UNIQUE DANCE PROGRAMME USED AT MAY PARTY GIVEN BY EMPLOYES OF CITIZENS' TELEPHONE COMPANY OF GRAND RAPIDS, MICHIGAN.

the officials of the company, who encourage the employes to become thoroughly acquainted with each other in a social, as well as business, way, even to the extent of participating in social functions among themselves, believing that affairs of this kind have a good effect on all concerned.

The latest event of this character indulged in by the genial workers of the Citizens' company was a May party given in Innes Rifle Armory, Monday evening, May 8. Several hundred persons, including employes and officials, attended the "hop," which was a success in every particular, and withal a most enjoyable and happy affair.

The dance programme was unique in the extreme and was the "hit" of the evening, reflecting credit on the ingenuity of those who conceived the idea. It showed the outside number selecting mechanism of an automatic telephone, and from each of the number holes radiated a line on which was printed the name of the dance and one of the parts of the automatic telephone apparatus. The programme is reproduced herewith.

Following is a list of the committees, to whom should be given the credit for managing the delightful event:

Arrangements—G. H. Higgins, chairman; G. F. Stratemeyer, J. E. Mooney, H. N. Leonard, Park Johnston, Ed. Linkfield.

Floor—Park Johnston, chairman; Frank V. Newman, Madge Midwinter, Margaret King, Mayme Brown, Anna Wardhouse, Joseph Billo, Leo Pyman.

Reception—G. F. Stratemeyer, chairman; C. F. Rood, E. B. Fisher, C. E. Tarte, Fannie McEwan, Louise Fortuyn, Ila Higgins, Daisie Mitchell, Anna McGee, Madge Atwood, Julia Lawless, Kate Murray.

PLAN TO CONSOLIDATE INTERESTS.

An announcement of great importance in the Independent telephonic world comes from Rochester, New York, to the effect that a deal has practically been completed whereby the telephone interests of the Independent Telephone Securities Company may pass into the control of the Rochester Telephone Company. Several conferences have been held between the representatives of the two concerns. It was at first rumored that the Rochester Telephone Company would pass into the control of the Independent Telephone Securities Company, but it is now claimed that the merger will be made by the Securities company passing into the hands of the Rochester company.

Exclusive of the Rochester company, the Independent Telephone Securities Company possesses about $326,000 in stock and $171,000 in bonds. It has 250 pay-stations and over 1,000 miles of wires, including the telephone systems in Otsego, Herkimer, Oneida, Lewis and Jefferson counties. If the deal is carried out the Rochester company will come into the control of the property of the Securities company, the most valuable affiliated company being the one at Rochester. It is said that the effort now under way is to centralize in Rochester the Independent telephone interests of the state and to further extend that system in opposition to the Bell company.

Indirectly the deal involves the expansion of one of Rochester's most prosperous industrial plants, the Stromberg-Carlson Telephone Manufacturing Company, at East Rochester. If the purchase of the control of the Securities company by the Rochester Telephone Company is consummated, followed by the acquisition of new systems in all the large cities and in every section of the state, it will make a combination that will be much stronger and more closely united in New York state than the Bell company, and it will mean that the capacity of the Stromberg-Carlson plant must be greatly increased at once. It is already under consideration to construct another large addition to the new plant and the force of employes will be increased in the same proportion.

"We don't know yet whether the Rochester Telephone Company will take over the Securities company or whether the Securities company will merge the Rochester—it looks very much like the former at the present time," said Manager Fuller of the Rochester company. "Committees chosen from both companies are canvassing the matter and we will know within the month what is going to be done."

One of the directors of the Rochester Telephone Company, when asked regarding the absorption of the Frontier Telephone Company of Buffalo by the Consolidated company, said:

"The next move will be the combination of the Buffalo and Rochester Independent interests."

When asked if any overtures had been made between the Buffalo and Rochester managers, he further replied:

"Not yet. Both have been too busy getting their own territory under control during the past six months. Now there are practically only two companies in the state, outside of New York city, in control of the Independent companies. At present the friendliest business relations exist between them, so that both are able to compete on even terms with the Bell company for long-distance business. For several years after the Rochester Telephone Company started it was handicapped by the fact that it was able to handle little long-distance business. It has been slow work to develop the hundreds of exchanges in small villages and hamlets, but all this has been accomplished, until the Independent companies, working in harmony, are able to compete on even terms with the Bell in any part of this state and to make many connections the Bell cannot give."

"The next step is inevitable," he concluded. "The two controlling Independent companies will get together within a very short time. All the Independent lines in the state will be managed from one center, and it is a pretty safe prediction that Rochester will be that center."

BELOIT COMPANY MAKES FINE SHOWING.

The Beloit Telephone Company of Beloit, Wisconsin, held its annual meeting May 10, which was well attended by the stockholders, who were very enthusiastic at the showing made by the directors and management for the past year. The company made 14 per cent on its stock during the year. The same board of directors were unanimously re-elected.

The officers elected were as follows: President, Rev. M. J. Ward; vice-president, W. H. Grinnell; treasurer, W. M. Brittan; secretary and manager, Alfred Slater.

After the stockholders' meeting, the directors held a meeting and declared a dividend of 4 per cent, the remaining 10 per cent to be left in the treasury for future extension and improvements. During the past year there have been several rumors, the origin of which it has been impossible to trace, that the Beloit Telephone Company was about to be absorbed by the Bell company, which rumor absolutely has no foundation in fact, as the Beloit company intends to continue in business as an Independent institution.

The Beloit company's rates are much less than those of its competitor and the citizens are determined that it shall be kept in the field to prevent a monopoly and extortionate rates. The Bell company has informed the public that it is about to enlarge and improve its plant, and therefore must increase its rates, as it is "not making any money at present," whereas the Beloit company, by charging the present Bell rate, could not only have made 14 per cent on its capital stock, as shown this year, but would have made 37 per cent.

Much of the credit for the success achieved by the Beloit company is due Manager Alfred Slater, who is not alone an able telephone man, but an indefatigable worker as well.

Questions and Answers

Conducted by J. C. Kelsey, Purdue University, Lafayette, Indiana

I have been making some experiments along the lines of electrolysis which seem to verify a theory I have held for some time, but which I have not mentioned until I had opportunity of making some tests. Briefly stated, it is: In order that there may be a heavy current flow along the sheath of an underground cable, the resistance of that sheath, together with the resistance of the earth from the rail to the point where the current enters, must approximate the rail and earth resistance along which it is intended that the current shall return to the power house; if, therefore, the resistance of the sheath be made extremely high by the interposition of insulating rings, or other similar devices, the flow of current will either be entirely prevented, or at least largely reduced, as the amount of current flowing in the two parallel paths would depend upon their respective resistance, in accordance with the well known Wheatstone bridge formula —measurements made between unspliced cables and the rail show practically no current flowing, an ordinary voltmeter failing to deflect, and a sensitive galvanometer showing the faintest possible deflection, and in some cases none at all. The same cables were then spliced up in the ordinary way (they paralleling the track for almost a mile) when the usual results were clearly shown, i. e., a considerable difference of potential between the rail and the cables, in some cases amounting to twenty volts. This trouble, of course, submitted to the usual remedies—heavy bonding of rail and cables and the thorough grounding of the bonded cables at the end nearest to the power house. Of course, this question of electrolysis presents no great difficulties, as it can always be remedied, but I conceive the prevention to be better than the cure, and if it be, as I suspect, possible to prevent it by putting an insulated ring in each sleeve that practice would be much better than we have at present.

Is it possible for current flowing transversely, that is, a trolley line crossing at right angles to the duct, to do damage? I have reason to suspect that this condition occurs oftener than one would think possible, as I have had trouble at such a point, even when the cables at either end showed no difference of potential with rail.—M.

There are two remedies generally known—bonding, as stated, and insulating the entire cable system. One can easily see that the present network of cable sheaths is exceedingly difficult to insulate, and insulation may be said to be impossible. The cost of insulating would exceed the cost of bonding. But the method mentioned by M, by the way, one of our best Independent engineers—that of putting in insulated sleeves—is easily one of the best solutions of the problem. That it would break up the destructive currents there can be no question. Even though the ducts were very damp, and the 400-foot section of cable laid in the duct, the cable would be exposed to a very small potential for that distance, even with a most viciously bonded railway system. The average bonded railway gives a drop of ten volts to the mile, 400 feet being but a thirteenth of that amount. Lying in the ducts, which are always some distance from the track, the resistance of the combination would prevent any flow of current, and as the cable would touch the damp duct its entire length, even a small difference of potential would have difficulty in existing.

In bonding, one has to be careful, or the bonds will be too large, and then the cable structure will be carrying all the return current, and destruction to the cable will certainly result.

About the transverse action, it is hard to imagine the amount of potential difference which could exist in a three-inch diameter cable, when a whole mile only shows a drop of ten volts, the trouble would seem so minute. Yet it is the constant effect, although slow, like the dropping of water, which will bore through the toughest stone. For my part, I would not say that damage cannot be done this way, because I believe anything can be done by the present method of allowing the earth to be used as a companion return for those abnormally heavy electrical currents due to street railways.

Electrolytic action shows itself by producing a pitted appearance upon the cable sheath. It can be easily recognized, intuitively, just as a stranger recognizes the rattle of the snake. The pitted action, if not delayed, will soon cause a ruined cable sheath. The sheaths are of very low resistance, and range lower than one ohm to the mile. The grounded trolley current, if the bonding is defective, favors the use of such a path, even though some distance away. The ground has very little resistance also. If the cables are in ducts, the ducts will offer appreciable resistance to the current, and may cause the returning current to prefer the rail return and other pipes, providing the cable is cut into small sections, as suggested by M., and insulated according to his views.

The trouble occurs where the current leaves the sheath. Here is where the bonding is necessary. It is plain to see that if the bond is large it would cause the cable network to gather all the more current. We are not popularly disposed to be burden carriers for the trolley company nor do we care to protect the city water pipes, and such, as telephone companies, do not get credit for their pains. I think if city councils that direct water plants half realized the benefit and protection the telephone company's cable plant offers their water plants, there would be no hesitation in giving franchises. This philanthropic feature should be developed.

A dangerous condition reveals itself by a positive potential to the earth, done by an ordinary voltmeter. This shows the current to be leaving the cable. Therefore, if an electro- by voltmeter measurements at succssive manholes. Know- negative condition cannot be brought about, bonding must be done to reduce the positive value to zero.

The direction of the flow of current may be determined by voltmeter measurements at successive manholes. Knowing the potential, or drop of potential, along that section of the sheath, it is easy to get at the approximate current flowing.

The bonding is done with large tinned wires, or a cable sheath may be flattened out and used. In soldering connections, one is liable to injure the cable sheath. The bond connections should be large enough to prevent heating, which fact will reveal itself quickly. But remember, not too large, for when heavy currents flow through lead sheaths, or to the sheath even, there is a decomposition of the salts contained in the earth, which attack lead, even after the current is shut off.

One thing to remember is, the polarity of the railway generators. Ordinarily, the trolley wire is positive and the earth negative. There are times when that might be reversed, and then all your electro-negative conditions are reversed, and serious electrolysis will be set up, before you suspect the trouble. An agreement with the trolley people is a good thing, whereby you may be certain that the trolley has the plus mark at all times.

I notice in an address made before a New York school by one of the telephone engineers of the Bell company that he says one-third of the gross receipts were necessary for the maintenance account. Is this a peculiarity of telephone systems? Does it not just as reasonably apply to street railway systems, which have much more wear and tear on the system? Is such a maintenance account necessary?—J. M.

It is ridiculous to assume that one-third of any company's gross receipts are necessary to maintain the plant. If it is true of telephone property, it is still more the case with railway companies. I know of one company that had a million-dollar plant, and that, in two years, charged $900,000 to maintenance. It is told that the Northern Pacific railroad was built, at least 1,000 miles

of it, out of earnings, in the guise of maintenance. What is it, then, but a scheme, pure and simple, to rob stockholders out of just dividends, and to build new work out of the earnings of the stockholders, without giving them credit for it? I do not pretend to be authority on these great financial matters—this frenzied business is too many for me—but maintenance in its true light does not mean new construction, and a million-dollar plant that charged $900,000 to maintenance in two years, simply built up the outlying country at the expense of the stockholders' income.

I am up against a decision whether to use metallic cable clips or marlin hangers. I have heard stories about each, and wish further light on this subject?—W.

I have heard from people who claim that the marlin hangers cause punctures in the cable, and that where metal hangers were used, not a case appeared. As the puncturing causes are mysterious, and as lightning is not a consistent performer, I am unable to say whether or not it is coincidence. As a rule, the supporting strand is in a grounded condition. If the cable is hung by marlin, it looks reasonable that charges could accumulate on the cable until they became powerful enough to leap to the supporting strand on their way to earth. Another might say that when lightning strikes it is usually wet or damp, and the cable is in the best of connection with the earthed supporting strand. It is also reasonable, with metallic clips, that the cable is in best of metallic connection with the earthed supporting strand, and charges cannot accumulate on the cable, which may become disruptive, and jump from the cable to the strand. I am not able to say which one is best.

Have run up against a snag. There are four or five lines running into our switchboard which work all right when talking to central, but as soon as you plug one of them through with another line, neither subscriber nor operator can hear. I remedied one such fault by changing the cable head, but that does not help the others. When we use a pair of plugs, to which a repeating coil is attached, the difficulty is removed.—M. E. C.

This must be a case of short-circuiting somewhere. When calling plug is inserted, a short-circuit must be caused, when neither subscriber or operator can hear. Or it may be that your calling plugs are not right. If the case is true, you could try answering with the calling plug to see if the calling subscriber could hear the operator, or vice versa. It is no open-circuit condition, for if so, the operator could always hear the calling subscriber. It looks as if the cut-off jack might be wired wrong, yet the use of the repeating coil plugs seems to disprove that. To prove that it is not the line jacks, connect two subscribers with a pair of cords connected on a board where you can see them, and bridge the operator on. It is hard to think that it is jack trouble, because the repeater cords work. And it is hard to think the cords are at fault, because they would not be affected the same. Unless the keys and cords were not wired wrong in the first place, I can suggest no remedy.

In Fig. 1, how shall we transpose *C* circuit from *E* to *N*, or from *E* to *T*, so as to balance the line from *B* to *N*, or *B* to *T*, or *C* to *T*?

2. How shall we transpose branch to *S*? How shall we transpose branch *T*?

3. How shall we transpost *B* circuit from *N* to *X*, so as to balance with *B* circuit from *B* to *E*?

4. Where do we start to transpose *B* circuit from *N* to *X*? Our starting place for transposing is at *B*, and, as you will see, from the other side of the diagram.

We want to retranspose our entire system as we rebuild, and would be pleased to get what information you can give. Let us know where to get good books on the subject? There are from two to ten grounded circuits along most of our lines, some on our poles, and others belonging to farmers on the same side of the road. All *C* circuits are transposed every mile, and the *B* circuits every half mile.—C. N. S.

About books on this subject, I can't tell you. Some day a book will be brought out that will neglect to refer to Mr. Carty's classical experiments. I think he would be relieved if it were done.

Branch *S* would not need more than one transposition to two miles, if the line is balanced from the resistance standpoint.

To answer question 4, start at point *M* and work both ways, also back to *E*, which is short, only 5/8 mile; however, a transposition a half mile from *M* would balance the

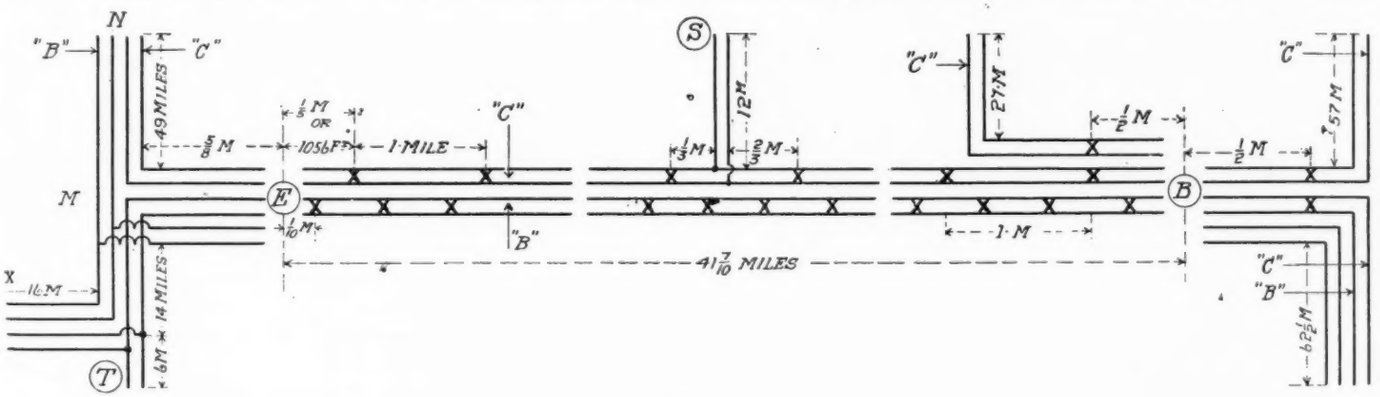


FIG. I.

present transposition to the right of *E*. *T* could be given mile transposition starting from *M*. *C* could be given mile transposition, also starting from *M*.

One can see that a curious network of wires confronts our Iowa friends. It seems to me that the lines should be arranged so as to present equal effects to each other, on the same lead, regardless of what is necessary for other leads. As I understand this case, exchanges terminate the lines at *E* and *B*. If, however, the lines are connected permanently, the present transposition between *E* and *B* should stand, and the remaining lines completed with due regard to the present transposition between *E* and *B*. At *M*, where *B* divides, the transpositions could be made a half mile apart, as if each leg of the line exists.

ELECTRICAL SHOW IN NEW YORK.

From December 12 to 23, the present year, there will be held in Madison Square Garden, New York city, an electrical trade show at which there will be shown all types of electrical apparatus and machinery. The construction of dynamos and motors of various types and the progress in telephony and telegraphy will be illustrated to the trade. Exhibit space will be sold and selling privileges for electrical novelties and other specialties will be disposed of. Information concerning the exhibit may be obtained from G. F. Server, director of exhibits, 26 Cortlandt street, New York.

An Emblem for the Independents

A Symposium of Suggestions from Our Readers

WIDESPREAD interest has been awakened in the ranks of the Independents by the publication in the May TELEPHONY of the article entitled, "An Emblem for the Independents," which dealt with the selection of a permanent, distinctive and uniform design for the use of all Independent telephone companies throughout the United States at pay-stations, as well as for signs and general advertising purposes. This need has long been felt and the discussion started in this paper last month was the first of its kind on the subject and, it is believed, will be productive of good results when the matter is brought up for final settlement at the Chicago convention this month.

The designs that have been most used by the Independents since the need of one became apparent in the early days of the movement are the shield and the Maltese cross, and the disposition among those high in Independent circles seems to be to eliminate the Maltese cross and all other similar symbols from the field of emblems and to settle upon the shield as the permanent design. It was this sentiment that caused O. J. Hobson of the Independent Telephone Company of Seattle, Washington, to come forward with his "I-T" design and submit it for consideration at the coming National convention.

In launching the emblem discussion last month this paper solicited offerings of designs from those interested in the matter, in the following words:

Now that the discussion regarding a distinctive and appropriate design for Independent companies has been launched, TELEPHONY is desirous of hearing from others who have ideas on this subject. It is not our purpose to conduct a contest in these columns, but to present for the benefit of those who will have the matter in charge at the national convention a variety of symbols—the more the better—from which a choice may be made and the question settled for once and all. * * * The sketch of the design which appeals to you as a good one need not necessarily be a work of art—a rough outline will do, and we will attend to having it perfected and prepared for publication. State your reasons clearly, and as briefly as possible, why you believe it is worthy of consideration and what are the points in its favor. Here is the opportunity to contribute to an important feature of the Independent movement and perhaps father the design that shall be used for all time to delineate the great idea of Independent telephony.

The response to TELEPHONY's appeal has been all that could be wished for. In addition to receiving the eight different designs herewith shown, we are in receipt of numerous letters bearing on the subject, showing how important a question the Independents, as a whole, consider the adoption of an appropriate and permanent emblem to be.

One of the most striking designs received is that submitted by W. H. S. Houck of the Union Telephone Company of Erie, Pennsylvania. As shown in the illustration it is in the form of a shield within a circle. Mr. Houck's letter explaining the same and setting forth its good points is as follows:

In response to your request for samples of emblems for Independent telephone companies, I submit the enclosed, believing it to be the most appropriate, striking and artistic one yet displayed. While being the shield, yet it is unlike any other now in use, as it is brought out in but two colors—white and blue—while the others in use are red, white and blue, with black letters printed across the red and white stripes, making a motley display.

The blue and white stand out clear and distinct, can be seen at a great distance and will not be mistaken for the United States Express Company's sign, Uncle Sam's Recruiting Station or a barber shop.

The circle adds greatly to the effectiveness of the design and affords compact space for the displaying of "Local and Long-Distance Pay-Station," without which, a separate sign would be necessary on pay-station booths.

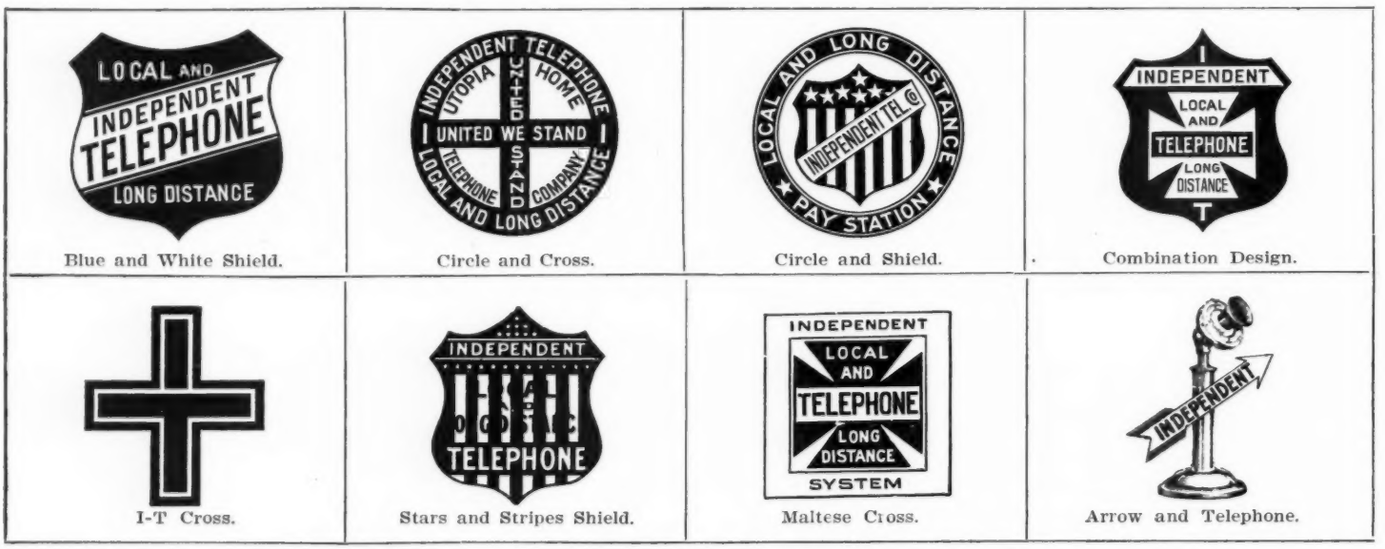
For stationery, etc., the name of the company can be displayed in the circle without changing the design, with "Independent" written on the ribbon across the shield. There is little use in enumerating its advantages, as it speaks for itself and the enclosed sample of the design will illustrate how far ahead of the Bell's bell it is.

R. L. Turner presents the most unique design of the lot, standing for harmony and a compromise and being a clever combination of the shield, Maltese cross and "I-T" cross, as shown herewith. Mr. Turner's letter follows:

Enclosed you will also find a diagram which gives my idea of an emblem for the Independents, and it will not only look well when properly designed, but will answer all requirements made of it by all sections of the country.

The shield and Maltese cross are practically the only emblems that have been used and the advocates of each could conscientiously adopt the combination, because it contains both Maltese cross and shield.

I think a happy medium—a compromise—would tend quite a good deal to soothe any ill-feeling that might arise should one be



DESIGNS SUBMITTED FOR A PERMANENT EMBLEM FOR THE INDEPENDENTS.

adopted to the exclusion of the other. If the Independents decide to use the emblem designed by me I would be glad. I also would be glad if they would remember that no one wishes them more success than I do.

J. H. Haskins, proprietor of the telephone system at Fort Gaines, Georgia, has an idea for an emblem which, in his own words, is "novel and decidedly unique." It is a combination of telephone and arrow, the latter bearing the single word, "Independent." The design is herewith shown, and Mr. Haskins says of it:

I have read with great interest the article in the May TELEPHONY entitled "An Emblem for the Independents." I note that you invite some discussion of the question and I desire to add a suggestion. It occurs to me that the emblem to be adopted should be not only neat and attractive, but should, above all things, be appropriate and suggestive—a sign, the very appearance of which would at once suggest not only "Independence," but the "telephone" as well. Further, it seems to me the emblem should be something novel and decidedly unique—something that is not used by any other line of business—so that when presented to one's view one would not be obliged to stop and read more closely in order to be sure as to what it was intended to represent. The design suggested by Mr. Hobson of Seattle, Washington, seems to me a step in that direction. I enclose a design, which may suggest to someone a thought that will be of benefit.

John C. Alexander of Marengo, Illinois, comes to the front with a design that is truly original, and unique as well, and in his opinion "fills the bill the best of anything yet offered." It is a cross within a circle, giving room for everything necessary to designate its purpose, etc., and including a double play of the motto, "United we stand." Mr. Alexander says of his offering:

While not an active Independent telephone man, I am a constant reader of your most excellent publication, and I am deeply interested in the selection of an appropriate permanent design for the Independent telephone interests of the country. Were the shield and Maltese cross not used by a hundred and one other concerns in advertising beer, breakfast foods, canned beans and other like commodities, the selection of either as an Independent design for all time might be looked upon with favor; and while I will not presume to say that the adoption of either at the Chicago convention may not be reasonable and for the best "good of the order," still, in my humble opinion, some emblem outside of these two would better serve the purposes of the Independents as a distinctive symbol.

My idea of what an appropriate Independent emblem should be is embodied in the sketch herewith enclosed—the circle and cross—at once original, compact and striking. The wording arrangement need not necessarily follow the exact lines as shown in my sketch, though I believe the words, "Independent Telephone—Local and Long-Distance," should be left in their present positions. The space where I have placed the name of the company, in the four quarter circles, may be cut out, if so desired, making the design still more conspicuous. I favor the double use of the motto, "United we stand," as I have shown, but if thought best this could be eliminated and in its stead placed the name of the company using the design. Another arrangement of the cross would be to put the words "Pay Station" in place of the motto, placing the second "t" of "station" where "we" is now, thus making an even break in the cross arrangement of the two words.

There is nothing complicated about this design—it is simple as A, B, C, and in my estimation fills the bill the best of anything yet offered. I hope the design adopted will be a *truly distinctive* one, not something already in use by the Toms, Dicks and Harrys of the commercial world in one form and another. Let us at least be original.

Matthew C. Smythe of Chicago contributes to the symposium of designs a shield arrangement that was quite popular several years ago and which he says "is simplicity itself and hits the nail squarely on the head." His letter follows:

I believe with TELEPHONY that "one of the most important matters to be acted upon by the coming national convention in Chicago will be the adoption of a uniform design for the use of all Independent telephone companies, that shall be as distinctive in its nature as the 'sign of the bell,' which is employed by the Bell company at all of its exchanges and toll stations throughout the country, and the appearance of which is an infallible guide to its offices wherever located."

I coincide with President Hoge in his opinion that the shield is the most appropriate insignia for the Independents; it already has come to be looked upon in many parts of the country as the emblem of the Independent movement, and I do not believe, even though it is used by certain business institutions for advertising purposes, that it would be good policy to discard it at this late date for some new design.

While favoring the shield design as a general proposition, I do not agree with President Hoge that the star-spangled and striped shield recommended by him and his colleagues for adoption is the best and most appropriate for use by the Independents. I have heard it stated by not a few since this discussion came up (and I am of the same opinion) that it is too much of a jumble of color—in short too involved and "mussy." Why more than two colors? The Independents are not competing with the rainbow or advertising Diamond dyes. Simplicity in color and general arrangement should mark whatever design is chosen.

The shield I favor (and I am surprised no one has entered it in the emblem contest before) is the one that was quite extensively advertised and utilized some years ago—the blue and white shield, with the all-important words, "Independent Telephone," sticking out on it so plainly that they can be read a block away; and that, as I understand it, is the purpose of a sign. The words, "Local and Long-Distance," are white on a blue background, in pleasing contrast to "Independent Telephone," making altogether the simplest kind of a design, and being striking and distinctive as well. It embodies all the qualities of the ideal emblem; it is simplicity itself and hits the nail squarely on the head.

Let it be understood that this design is not original with me—I am simply acting the role of its champion, in the hope that an appreciation of its good qualities may induce the Independents at their convention in Chicago in June to adopt it as their permanent symbol.

Walter E. Price writes as follows from Waitsburg, Washington, suggesting the use of an emblem representing a wall telephone set:

In looking over the May TELEPHONY I noticed there was a move on foot to select an appropriate emblem for the Independent telephone pay-stations, and it occurred to me after some thought—why not use a form of telephone for an emblem? It could be made neat, nobby and very attractive, and would be to the Independents what the bell emblem is to the Bell company; and the clock emblem to the jewelry store. The emblem should have printed across its face (which should be either two or four in number), "Independent Telephone Pay-Station." "Local and Long-Distance" also may be put on, if thought necessary. The design may be made of metal, pressed or raised work, representing an exact outline of a telephone, showing front view, and could be suspended to a crane fastened to wall or post, and if in a large city it might be made four-sided and of glass and be lighted by electric or gas light at night.

"Independent," writing from Hudson, New York, emphatically disapproves of the Maltese cross or any other form of cross as a design for the Independents, declaring himself strongly in favor of the shield, as follows:

I am not seeking notoriety, merely expressing an opinion, as you suggest, concerning an emblem for the Independents. The Maltese cross has been for years the insignia of a certain division of the Masonic order, and as such should be recognized and respected. The Independents would gain nothing and lose much if it were adopted. The other "cross" you illustrated—the "idea" of Mr. Hobson—is in still worse taste, because it is practically the symbol of the Christian church. The "idea," if such it may be called, is too far-fetched—as a combination of an "I" and a "T" it is about as pretty as the result or product of a combination between a jackass and a horse, without the usefulness of the latter. It seems to me to be in such execrable taste, that it should not receive a moment's consideration. The shield was adopted as a symbol of independence and liberty when the people of this country threw off the yoke of old England, and has remained as such through all the intervening years. It belongs to all the people of this land, and has been utilized and adopted in many ways. What more fitting, or more in keeping with the purpose of Independent telephony, than that the shield of American independence should be adopted as the symbol of telephone independence? It seems to me to be so entirely logical, consistent, and peculiarly symbolical, that very little room should be found for discussion.

There are now nine entries in the design contest, as follows: Stars-and-stripes shield; Maltese cross; "I-T" cross; circle and shield; circle and cross; shield, Maltese cross and I-T combination; arrow and telephone; blue and white shield, and wall telephone set. The entire number, with the exception of the wall telephone set, which is familiar to everyone, are herewith shown and are respectfully referred to the officials of the National-Interstate body and all others interested. "You pays your money and takes your choice."

Some keen-nosed statistician has made the discovery that since the last census bulletin was issued on the development of the telephone in the United States, in 1902, the business has practically doubled. It is growing so fast that even the daily newspapers are unable to keep fully abreast of it.

Concerning Party Line Switching

SAMUEL G. McMEEN

THIS subject was treated in the February issue, in which, it will be recalled, were treated two systems of handling two- and four-party lines equipped with selective ringers. Considering, for example, the arrangement in the central office of a four-party line, that article described means by which calls from either of the stations of such a line would be received on a single answering jack and lamp, while calls for the several stations on the line were handled by means of four separate sets of multiple jacks, a set corresponding to each station on the line. The means enabling the cord circuits to discriminate among the four stations, to the end of selecting the desired one, are based upon the use of certain marginal relays and a certain transposition of the two wires of the line.

An interesting communication has been received from J. H. Winfield of Halifax, Nova Scotia, in which he points out a feature of such operation which was not covered in the article in question. The point Mr. Winfield makes is that in an office of several thousand subscribers, equipped with a multiple board of either the relay or magneto type, the two distinct line numbers which are assigned to the stations on a two-party line may not, under the scheme of things, have any numerical relation with each other, as the equipment of such a line or a similar four-party line in the multiple board is quite the same as that of an individual line. There is nothing to indicate to the operator any difference between a call from a station on such a party line for another station on that line and any usual call for a connection between two distinct and separate lines. Mr. Winfield further comments that the only solution which suggests itself is that each operator serving party lines must have her memory so stored and so trained as to be able to recognize any call which belongs to this class requiring ringing back over the calling circuit.

Edwin H. Smythe has aptly termed such calls "reverting" ones, and it has been an effort for many years to devise methods by which reverting calls would be completed in exactly the same manner as all other calls, in order that the operator may be relieved of any necessity of remembering special things, executing special operations, or returning false busy information to a calling subscriber.

The requirement has been fulfilled by an invention of J. J. O'Connell, expert designer of circuits. His accomplishment has the characteristic marks of his production, in that it may be used with a minimum of special apparatus, is free from likelihood of making errors, and imposes no special hardships upon the operator.

Preliminary to a study of the simple circuit involved, it is to be recalled that in various phases of special signaling by and between operators, advantage is taken of the possibility of impressing such currents upon lines and circuits as will give musical tones when carried through a telephone receiver. By differences in pitch, by combinations of different pitches, and by interruption of the tones themselves, a great variety of distinct audible signals may be procured. In practically all applications, these currents are produced by breaking a battery current by means of a commutator, and in most cases by introducing also the transforming action of a repeating coil.

In the drawing accompanying this article (Fig. 1), circuits *1* and *2* are intended to represent two similar subscribers' lines entering an office equipped with a common battery relay switchboard. The line and cord circuits chosen for illustration are of the three-wire type, and the general scheme of things is the same as that under which the circuits illustrated in the February issue were designed to operate.

The cord circuit is standard in its principal details. The relay *A*, a contact of the listening key *K*, and the condenser *C*, are items of apparatus requiring to be supplied specially to the equipment of each operator handling party lines, which may make reverting calls. The tone-interrupter *I* and the transformer *T* are also parts of this reverting call test apparatus, but are required in but a single equipment per office. An operator serving no party lines needs none of this equipment.

Observation of the figure will show that as the listening-key *K* must be operated to close all its contacts before a busy test can be made by means of the plug *c*, the making of such a test upon a busy line will cause current, not only through the operator's telephone set, but through the relay *A* to ground. Naturally, if the tested line is not busy, no potential will be encountered by the tip of the plug *c*, and therefore the relay *A* will not be operated.

Noting that an operation of this relay always takes place when a busy line is found, it will be seen that as the interrupter *I* is constantly in motion, is constantly breaking the

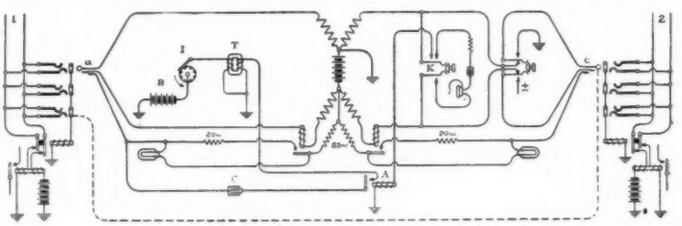


FIG. 1.

current of the battery *B* through a winding of the transformer *T*, current must flow, when the relay contact closes, through the condenser *C*, to and through the test ring circuit of line *1*, to ground through the cut-off relay. And it is interesting to observe that such a temporary supply of tone-current is transmitted to the test rings of the calling line, whether or not the called line be in any way special. The only requirement is that the tested line be found busy. If, however, it be assumed that the called line was the calling line, or, in other words, that a reverting call had been made, the dotted line between the tip of the plug *c* and the bushing of the line *1* will help to show how the tone test is heard by the operator in such a case.

The plug *a* in the answering jack places an ordinary busy test potential on the test rings of the line throughout the multiple, whether it appear as one, as two, or as four lines. The resultant test with the plug *c* establishes the circuit shown by the dotted line; the relay *A* operates; a tone is impressed upon all the test rings in question during the temporary period of the test contact; the tone is heard in the operator's telephone, because of its passage over the same path in her equipment as is followed by the usual non-musical test click. As the tone indicates that the call is a reverting one, it is sufficient for the operator to notify the calling subscriber that the desired station is on his line, whereupon he may hang up his receiver temporarily while she rings the wanted station, or take such other action as the circumstances may require.

When it is remembered that the time of contact between the testing plug and tested line is very short, and that the relay *A* must operate to put on the tone before that contact

ends, it will be realized that the operation of the mechanism needs to be quick. This quickness may be arrived at in two ways; one is to proportion the relay *A* in such a way that it will be very active in its operation, and another is to increase, if necessary, the potential at the test rings of such busy lines as may require the tone test specialty.

This increase of potential will be seen to be provided for in the drawing illustrating this article. In circuits of the general type to which this belongs, it is customary to shunt the supervisory lamp during conversation by means of a resistance of forty ohms. In this circuit the lamp is shunted by a resistance of twenty ohms, which increases the effective potential at the test rings of a busy line by an appreciable and useful amount.

It is to be noted that the only matter the operator has to remember is that a regular test click means "busy," and a special tone means "reverting."

The party line equipment, which has been considered in this article and in that in the February issue, is of the type considered suitable in giving a service most nearly equal in quality to individual line service. To secure to the operating company and to the subscriber as many of the advantages of individual line service, while still subdividing the usefulness and cost of the line among several stations, is certainly a proper accomplishment to be undertaken. The calling of a station, therefore, by the central office requires to be done without giving any signal at either of the other stations on the line.

Many methods have been devised in which this condition of selective signals is provided, and there seems to be no objection to the application of well-tried methods to the production of the two-party line system in which a standard ringer is bridged from one wire or the other of the line to ground at each station. As a condenser can be used in series with this ringer, and the latter may be of high resistance and impedance, the line is kept free from a permanent ground or bridge, which will interfere with central office signals by allowing current from the central office source to flow through it continually. The high impedance of the ringer is sufficient also to prevent serious disturbance upon the line when it passes through regions of considerable electrical exposure.

The four-party selective problem presents a greater difficulty. The system which is used most extensively by the Bell company retains the ringer in practically its original form, with high impedance and a polarizing magnet. Instead of signals being produced by an alternating current of a frequency of about 1,000 cycles per minute, they are accomplished by a pulsating current composed of intervals of current and no current of that frequency. The current impulses are all in one direction during a given signal. It is usual to secure these currents by means of commutation from the standard form of alternating ringing current.

As the standard ringer is essentially an alternating current device, in which reversals of current direction throw the armature from side to side with a frequency the same as that of the actuating current, a constant flow in one direction, or even an intermittent flow in one direction, will not produce a practical signal; but by adding to the ringer a spiral or other directing spring, always tending to keep the armature drawn to one side, a pulsating current of one direction may be made to pull the armature against that spring during one-half cycle, releasing it to be drawn back by the spring during the other half cycle. The ringer thus goes through a performance quite similar to that of being driven by an alternating current, and under the best conditions a fairly satisfactory signal is secured. By this arrangement, also, current of pulsations in the opposite direction produces no signal.

But ideal conditions are met in the telephone art as seldom as in any other activity of life, so that occasions are found in which the central office ringing apparatus produces a frequency a little above one thousand, something below it, or a voltage greater or less than that for which the party line ringers have been adjusted. Difficulties like these are especially likely to be experienced when the central office current-source is a motor-generator outfit, driven by a power circuit subject to considerable variations of voltage. Similarly these changes in frequency and voltage are experienced when the ringing outfit is a motor-generator, or dynamotor driven by current from the central office storage battery.

It may seem that the storage-battery-driven outfit would be found to be most constant in its output, and this would be so were it not for the fact that the voltage of each cell of such a battery rises during the time of charging the string of cells. A battery of eleven cells has a normal difference of potential of twenty-six to twenty-seven volts during the latter part of a proper charge. This variation, which is over twenty per cent, is great enough to produce poor signals during, perhaps, a third of the day on all the four-party line stations of a system. If the ringers generally are adjusted to respond to the low voltage and low frequency existing during the discharge of the battery, the signals will be unsatisfactory during all the period of high voltage and high frequency. Naturally the converse is true. As it is usual to equip central offices with one ringing outfit driven by a storage battery and another driven by some prime source of energy, the ringers may be adjusted for one output and fail to operate satisfactorily on the other.

There are several excellent ways of overcoming the difficulties here recited. One of them is an ingenious application of the "back pressure" feature of unformed lead storage battery plates immersed in a storage battery solution. If these are inserted in the circuit which drives the ringing outfit, they will be found to develop a terminal potential opposing that of the driving current, and thus to reduce the effective potential at the terminals of the driven thing. This reduction is approximately two volts per cell and is greater or less as the driving current is large or small. The practice is to insert these cells one at a time, automatically or by hand, after the beginning of charge, and thus to limit the maximum variation to something in the neighborhood of two volts.

A most promising opportunity for producing systems of selective signals has always seemed to be that involving harmonics. Many investigators have worked in that field, and it was along such lines, although in telegraph research, that both Professor Bell and Dr. Gray were led to the production of their telephones. No complete and commercial system of harmonic signals for party-station telephone lines had been developed up to the time of the production of the harmonic selective signal system of W. W. Dean. His system has been frequently described and is very attractive, but may be summed up as being a harmonic system using polarized ringers, tuned to respond to different frequencies, bridged across the line in series with condensers and with no ground taps. The frequencies to which the ringers respond are 1,000, 2,000, 3,000 and 4,000 per minute.

In all harmonic systems it is very essential that the ringing currents be kept constant at their proper frequencies. The exact constancy of potential is not of so great importance. Even commercial power circuits are very frequently subjected to enough variation of voltage to destroy the integrity of the ringing frequencies produced in motor-generators which they drive.

The difficulty of varying frequencies caused by varying speeds of the current-producing outfit has been overcome by Mr. Dean in a most ingenious way, involving a simple and effective governor. The slight study which its understanding requires will be well repaid to those who are not already familiar with it. Such a description may be found in several of the technical journals.

It may be said that the pulsating current four-party system first described is a four-party, rather than a three or five or more party system, simply because there are but two

wires in the line and but two possible current directions. And two and two make four. The harmonic system, however, need not be limited to four stations, even if the ringers are bridged across the line, and may be made to accommodate eight or more stations if the ringers are bridged to ground through condensers from each wire of the line.

It may be taken as an established principle that for the best results to all, party station signals must be selective and non-interfering. The question of how many stations may safely be put upon a line cannot be answered arbitrarily with any greater exactness than the old question, now long properly neglected, as to how many subscribers' lines can be placed under the successful care of one operator. There was a time when a hundred lines per operator was quite the fashionable practice; now no one denies that the proper solution is the simple one of giving the operator only such a number of calls as she can complete with perfect accuracy, whether they come from one line or from two hundred.

The party line analogy is very close to this. As it is the implied bargain between the seller and user of telephone service that the facilities of the system shall be always at the command of the user, the number of calls carried by the party line must always be few enough so that the subscriber will find his own line busy very rarely indeed. Anything more than this leads to discontent, and if much more, to ultimate party-line disaster.

It may not be seen how, from the standpoint of service alone, anyone can be consistently a party line advocate. Nor does it immediately appear, on the other hand, how anyone with a fair view of the ultimate condition in mind may contend that the only permissible party line is the one-party line. The cost of telephone circuits is so high, and under likely industrial conditions will remain so high, that some subdivision of the annual cost per circuit must be made among a plurality of stations, if all the elements of possible cheapening are to be seized. And in this view it is not overlooked that the cost of switching a call from a party line is for several reasons always a little greater than that of making a switch from an individual line.

The thing which is needed is an effort by a properly disposed and interested person toward the finding of a new, or the applying of an old principle, which will give some form of line subdivision and station selection which has not as yet been tried. Speaking somewhat loosely, it may be said that every form of electrical distribution but this involves a very considerable common use of conductors, and that in the telephone art alone is so large a proportion of the physical structure dedicated to the particular use of the consumer and kept idle through so much of the time.

It is not generally known, but it is very true, that where many messages are going in the same direction the number of circuits required to carry them diminishes in ratio as the number of messages increases. Stated in another way, a circuit between two points will carry more messages in a day as there are more circuits between those points. This is naturally based upon the constant assumption that there must always be a circuit ready to care for a message immediately upon its appearance.

A possibly satisfactory way, therefore, of solving the party line problem may lie in the proposal which has been made from time to time by various engineers of providing between a central office and, for example, an apartment building, a number of circuits, any one of which may become temporarily the individual circuit of any subscriber having an equipment within that house. Such a combination of automatic exchange, party line and trunk line methods seems to have in it the germ of economy, particularly in the consideration of the new problems presented by greatly congested city areas.

The telephone is the keynote of modern progress and mirrors the life and activity of present-day civilization.

CANINE TELEPHONY BALKS BURGLARY.

The newspapers of a certain Iowa county seat briefly chronicled a short time ago the conviction of one "Red" Mallers on a charge of burglary, but as to the means by which he was apprehended they said nothing, probably for the reason that no testimony bearing upon the point was introduced at the trial, and thereby missed a good story.

A newspaper man chanced to be visiting in the home of the county sheriff at the time Mr. Mallers was brought in from the remote village where the burglary had been attempted and as time was hanging a bit heavy on his hands, and as Mr. Mallers impressed him as being of a good-natured and interesting sort, he requested permission to interview him, which permission was granted.

"Mr. Mallers," he began, "you were, I believe, caught in the very act of burglarizing the store of one James Whitney at Yellow Falls last night. Is this correct?"

"It is correct," he grunted.

"You must have neglected to observe the ordinary precautions, Mr. Mallers."

"I didn't."

"Have you any objections to telling me how it happened?"

"No." He lighted a cigar and straightway drilled into the story. "I knew Whitney kept a pup in his store nights to bark an alarm whenever some misguided miscreant like me tried to get next the cash in the strong box, but that didn't worry me any. Dogs never do; I understand 'em. Never saw a dog yet I couldn't get on the good side of. This particular dog was a fox terrier, and a fox terrier had rather be a good fellow than kick up a fuss any day. I was fixed for him: had a bag of candy and a lovely bone, and I entertained no doubt as to my ability to get onto his curves when the game was called. And I did. Of course he barked a little at first, but 'twasn't two minutes until we were on the best of terms, talking like old college chums. 'Spot' says I—for I had taken the trouble to learn his name—'you're sure one of the best pups I ever met.' 'Red,' says he, with his stub of a tail, "you're a genuine gentleman. Go on with your safe cracking, old man, and may heaven bless you.' I went on and he lay there on the floor with the candy and bone between his front feet until he went to sleep. Then all of a sudden, when I had the steel plate about half drilled through, the front door opened slapbang, the electric lights flashed up, and I made a bolt for the back window, where I'd got in, and jumped kerslap into the arms of six men—and here I am."

"You made no fight?" asked the reporter, surprisedly.

"No. That's my weakness. I'd rather serve forty years than kill a man. I let 'em chain me up to suit their fancy, and then I says to Whitney, who was holding the pup in his arms and talking to him like a baby, 'You've caught me for fair, sir,' says I, 'but I wish you'd tell me how you did it.' 'Sure, I will,' says Whitney, 'always glad to accommodate, as my ad says; 'twas the dog.' 'Go on,' says I; 'that pup hasn't made a sound since I got in here, barring one or two small barks that couldn't be noticed outside.' 'No,' says Whitney, rubbing his cheek against the pup's head; 'he's too smart to make much of a hullabaloo, Spotty is; you made the noise.' 'You're a liar, sir,' says I respectfully. 'But you did,' says Whitney; 'you talked a blue streak to the pup; I heard you.' And then I tumbled some and looked around and sure enough there was a telephone on the wall with the circuit open, but that didn't explain everything. 'Yes,' says I; 'but how in blazes do you know when to listen at your end of the line? You don't sit up all night with the telephone at your ear, do you?' 'I do not,' says Whitney, 'but Spotty's brother sleeps in a box which has a place in the side of it for holding a telephone receiver, and every night before I go to bed I put the receiver into it, listen end in. Spotty has a very sharp voice. One or two yips from him here in the store and the other pup wakes up and yips down at the house. Then I get up and listen."

Ordinary Telephone Construction

J. L. W. ZIETLOW

AS THERE are several phases which could be treated under the head of construction (each of which would require a lengthy discussion), I will touch upon general and ordinary construction only, such as is necessary for economical operation, adequate service and the safety of the public in general, avoiding all technical and scientific phrases. This country being sparsely settled and the towns and cities small, the rules governing construction in larger cities are not applicable here, or, at least, to follow them would be an unnecessary waste of capital.

In constructing a telephone system, the first consideration should be, the results to be obtained. It would be foolish to use eight-inch top, thirty-five-foot poles, forty per mile, for the purpose of carrying only a single, or perhaps two, four or six wires, while on the other hand, it would be a greater mistake—in fact, it would be a criminal error—to use three-inch, eight, ten, twelve or sixteen-foot poles for the purpose of constructing a public telephone line. The great drawback to good telephone construction is the fact that anything in the shape of a line will work to start with; but the serious question is, "Will it continue to work?"

Ever since I have been in the telephone business I have recognized the fact that experiments are costly and it is folly to experiment with something (at the public's or my own expense) that good practice has long since discarded, yet it became necessary to experiment more or less with different kinds of construction, as well as appliances, in the early 80's, because the rules governing telephone practice were not well defined. Circumstances sometimes necessitate makeshifts, but these invariably prove very expensive and should be avoided, if possible.

In 1886 I was called upon to construct a line to a certain stock farm; the distance given was 1½ miles. I had material enough to build this distance, but found that I still had another mile to cover. Noticing a fence wire running up to the stock farm, I conceived the idea of using it for the purpose of establishing communication and the results seemed satisfactory. (By the way, I believe this was the first barbed-wire telephone line on record; in fact, the newspapers contained a number of comments on it. Some of them regarding it as quite a "hit"; others were very funny, indeed.) Myself, as well as the owner of the stock farm, congratulated ourselves on hitting upon this idea, thus saving about $50 on the cost of the line. A few months after, however, at a very critical time, when the line was badly needed, cattle broke down the fence wire; these people tried to telephone, did not succeed, and their having depended on the telephone previously caused them to sustain a loss of over $1,000, and it goes without saying that I have been prejudiced against fence wire telephone lines ever since. Many of them are being used, but I know of many bad mishaps; and in one particular case, the loss of a human life is attributed to a barbed wire telephone line failing to work. Cheap, smooth fence wire lines, strung on eight or ten-foot poles, have also caused loss of property and jeopardized human life.

In 1897 one of the most successful business men in this state said to me, "Do not mention telephone lines to me. I built one last year and have lost thousands of dollars' worth of property because it failed to work when needed most. Had we not depended on it, we would have made other arrangements." I found that this was a line built out of old telegraph poles and new four-inch top, ten-foot posts, and a No. 12 smooth fence wire. Such lines always, like cheap telephones, at first work as well as the best. As an operating company, however, we cannot afford to rely on them.

In the early days I considered twenty-foot poles about the thing. They can be bought and handled cheaply and a cheap line can be constructed which, apparently, works satisfactorily at first. I have found, however, by bitter experience, that such lines are very expensive to maintain on account of many small buildings being moved, and artesian well outfits and hay-stacking devices being hauled about, which will, invariably, tear down such lines; and in our part of the country threshing machines practically keep lines of this kind disabled during the threshing season, when most needed, causing the expense account and the ill-will of the public to increase enormously, and the earnings to greatly decrease; hence, we decided to use longer poles, because wires put up on twenty-five-foot poles are, invariably, out of the way of ordinary traffic, including the moving of threshing machines, well rigs, hay-stackers, etc., as well as admitting of a broken-off pole being reset without endangering life and property.

What caused me to make a radical change was when a hay-stacker was pulled under a line, strung on twenty-foot poles, pulling off a bracket, causing the wire to sag to within thirteen feet of the ground (this being three feet lower than the law allows). Another hay-stacker coming along shortly afterward caught the wire and pulled it down so as to obstruct ordinary travel. We never learned the identity of the first party and the wire being only thirteen feet above the ground, we had no legal recourse in the second instance. Being at a time of day when many farmers traveled toward their homes, a great many noticed the wire down, and one of them, having his family with him, was caught in it. His wife claimed to have been severely injured and we paid a judgment of $2,700. Numerous other minor accident claims have been settled by us, hence I do not want any more wire strung on twenty-foot poles. I mention these occurrences, as they speak more eloquently than any theory that can be advanced in favor of good or poor construction. It would be economy for operating companies to use nothing less than five-inch twenty-five-foot poles, and longer and heavier ones where necessary.

The route for country lines should be carefully selected to avoid rolling country, as well as trees and obstructions, as much as possible. Where this cannot be done, great care should be taken to have the poles well graded so as to cause the wires to rest equally on all the insulators, thus obviating the tendency of wires to break at certain points. Poles should be set not less than four feet in the ground, in good, solid soil, and where the soil is not firm, they should be set to a depth of from five to six feet. They also should be properly anchored at corners and curves.

In the use of brackets, care should be taken to get good stock; the ordinary bracket is a very poor thing to buy, no matter how cheap it is. For permanent single-wire lines, poles should be set, at least twenty-five per mile. For ordinary iron metallic lines, thirty-five or forty poles per mile are sufficient; for copper lines, from forty to fifty poles should be used.

Railroad crossings need to be well considered. At such, the elevation of the poles should be greater, and the lowest wire should not be attached at less than thirty-two feet

*Paper read before the South Dakota Independent Telephone Association at Sioux Falls, South Dakota.

above the level of the track. Spans crossing a track should be as short as possible, yet care must be used not to get a pole close enough to interfere with regular railroad traffic. While in an emergency poles may be set ten feet from the rail, it is better to keep farther away; in fact, a good practice would be to keep far enough away so that in case a pole should break it cannot fall across the track. The rule used to be that wires must clear the rails at least twenty-five feet, but since the advent of high cars, some of the railroads demand that the wires must clear the track at least thirty feet, and while there is no law to compel anyone to put them at this elevation, it is best to do so, for should an accident happen on account of a low wire, the courts would be inclined to hold that the telephone company had been negligent, and award heavy damages.

One reason for railroads demanding better and higher crossings is that a number of trainmen have met with accidents during the past two years on account of poorly constructed crossings. In crossing railroad tracks on a bracket line, double brackets should be used and proper guard wires should be attached. When cross-arms are resorted to instead, double arms should be used. While ordinarily lightning rods need not be used oftener than one on every fourth or fifth pole, it is advisable to protect the two tallest poles at a railroad crossing by suitable lightning rods, thus lessening the danger of the poles being struck and the chance of wires dropping down, and avoiding trouble to passing trains. If railroads will permit, underground crossings are desirable, as they eliminate all danger.

Where it is contemplated to use more than one circuit, cross-arming is preferable, and on main lines nothing less than a six-pin arm should be used. These should be of standard size, viz., 3¼ by 4¼ inches, bored for 1¼-inch pins, provided locust pins are used. If oak pins are preferred, 1½-inch pins should be substituted. However, the 1¼-inch locust pins are preferable. The so-called "telephone" cross-arm should never be used for anything more than a four-pin arm. Washington fir seems to make the best cross-arm, although a great many advocate long leaf yellow pine, as well as Norway pine, but on account of the pitchy nature of the Washington fir and the absence of knots and dry rot it is preferable, as it does not require painting, and a lineman can, at a glance, determine the soundness and strength of such an arm, whereas, where painted arms are used, defects may exist that cannot be readily noticed. I have known linemen to fall on account of not being able to judge the strength of an arm. Arms of from six pins upward, in all cases, should be secured with two braces, at least twenty-four inches long.

Poles should be properly gained, but care must be exercised not to cut gains too deep. It is better to simply flatten a small pole than to cut very far into it. The best way to fasten the arms to the poles is by using ½ or ⅝-inch bolts (according to the length of the arm to be used), which will reach through the pole and can be fastened with a nut. A good-sized square washer should be used under the head of the bolt, as well as the nut. This method of fastening is preferable to the lag bolt, inasmuch as a clean hole can be bored, thus preventing the pole rotting on account of the laceration of the wood in driving lag bolts. Galvanized bolts are preferable and should always be used in heavy construction. For short cross-arms one substantial brace is all that is required, provided a pole can be properly gained. If only flattened, two braces should be used.

Care should be used in selecting wire, the service required to be considered. For short distances and only a few stations on a line No. 12 wire may be used. Of course, the E. B. B. is preferable; however, more B. B. wire is used than any other. The latter may be used advantageously for short distances, and in that case a No. 10 can be substituted for No. 12 E. B. B. The cost and conductivity in this case is practically the same. However, when special strength is no object, the No. 12 is preferable on account of its being less susceptible to earth currents and noises produced by static disturbances. The steel wire should not be used for lines more than five miles in length.

The tying of wires is quite important, although it looks very simple. A great deal of unnecessary expense may be avoided if care is taken in this work, and tie wrenches are used instead of the ordinary pliers.

For country line construction single wire lines answer better than metallic lines, for the reason that they cause less trouble and expense; they work as well as metallic lines, in fact, better, where no disturbing elements are encountered. Where the latter appear, it is necessary to use metallic construction. A great many people carry the idea that by using metallic lines the ringing and talking qualities will be improved. This is erroneous, because a metallic line increases the resistance of the circuit. It is on this account that it is necessary to resort to the use of copper, instead of iron, because the resistance of the iron metallic line is too great for successful long-distance telephone work. By using copper the resistance is decreased very often to within one-eighth and down to one-sixteenth the resistance of an iron line, according to the size of the wire used. A copper wire with only one-tenth the resistance of an iron wire gives good results. When I made the statement that a grounded line was better for country work, I did it advisedly, realizing that the statement would be challenged. The fact, however, remains that a metallic line is more expensive to operate than a grounded line. Three times as much trouble will occur on a common metallic line as on a single or grounded line, and when it comes to copper metallic lines the ratio of trouble and expense of maintenance is still greater. On this account it is necessary to use nothing but the very best construction, using at least from forty to fifty poles to the mile, thereby reducing strain and other causes of trouble.

The ordinary method of guying lines is to plant a log, either using a guy rod or a guy post; and I wish to emphasize that too much care cannot be observed in this work. A great deal of trouble may be avoided if a little extra time is spent on guying corners and ends of lines properly. Where the strain is not great the small guy anchors can be used to good advantage, being much cheaper than the digging of holes and the burying of heavy logs.

On iron lines it is, of course, preferable to solder all joints where you have a good, reliable man to do this. Where slip-shod methods are employed, it is better not to resort to it at all. I have had occasion to examine many joints that were soldered on the outside, but the contacts were absolutely rusty, caused by imperfect work, whereas a line not soldered at all gave good satisfaction. In places where copper is connected to iron lines, it is necessary that soldering be done, on account of the galvanic action between the copper and the galvanizing. However, I have in many cases during cold and severe weather refrained from soldering, simply making a double, air-tight joint, thus bridging over until proper weather conditions permitted a good job of soldering.

Too much care cannot be taken in grounding, whether it be for ground lines or lightning arresters. Slip-shod methods in this respect cause an endless amount of trouble.

The same general rules governing country or toll line construction, in a measure, apply to town and city work. In constructing an exchange, the first thing necessary is to ascertain the number of subscribers, locating same on a plat for the different leads, and taking into consideration the probable number of subscribers that will be offered in the future. This, however, is very difficult to estimate in a small, yet growing, town. I have many times attempted to provide for additional facilities in certain districts, only to find that the business in such did not increase as rapidly as in some unforeseen quarter. This very often causes un-

necessary expense. I have found it necessary to rebuild exchanges four different times before getting proper bearings. Of course, in older towns, this feature is eliminated.

Poles used in exchange work in the business portion of a town should be large enough to carry an increase of load of from fifty to one hundred per cent. Money expended in this direction is not wasted. In the outlying districts changes may be made according to present demands. In the ordinary Dakota town, forty, thirty-five and thirty-foot poles are sufficient—using the taller ones in the center of the system, and running down to the thirty-foot poles in the outskirts. The poles should be stepped, will look better if painted, and will last longer if wrapped to a distance of about five feet from the ground. Not less than seven-inch tops should be used on the thirty-foot poles, and as high as ten-inch tops on the forty-foot poles. Twelve-pin cross-arms should be used where uniform leads can be strung, tapering off in the outskirts to any size that may be required. Cross-arms should be about eighteen inches apart, well bolted on and braced. The practice of nailing brackets and knobs to cross-arms should not be resorted to. If leads become too heavy with wires, care should be used not to get the cross-arms too low. It is preferable to use cable to bring in a certain amount of work from the outlying districts.

A great deal is being said about overhead cable construction for exchanges. This is really a good practice, provided the leads are heavy and many obstructions in the shape of trees exist. It has its drawbacks, on account of moving buildings, etc. Care must be used not to construct an aerial cable lead where the burning of a building will interrupt the service. If absolutely necessary to occupy alleys, it should be done with open work or underground construction. I have an instance in mind where a small fire, quickly put out, but in an alley, directly, as it were, under a cable, melted the lead covering and burned the paper insulation, thus disabling the whole exchange.

In many of the small Dakota towns the councils, foolishly, insist on wires being placed in the alleys, using as an argument that it is the practice in larger cities, such as Minneapolis, Chicago and New York, little realizing that there are more wires in these cities in the outlying districts and single buildings than is strung in a good-sized Dakota town. Where, however, this demand is made it is not practicable to use aerial cable, because old buildings and barns are invariably located close to the alleys, and in case a fire occurs, no matter how small, disaster follows. Where heavy leads are necessary and where the business of a town has developed far enough, it is safe and economical to put in underground work and thus eliminate all the trouble incident to overhead construction. It is, however, not profitable to use this class of construction wherever it may be demanded by a councilman who is desirous of making a reputation only at the expense of the telephone company.

Realizing, however, that this subject is too broad to admit of all its phases being treated in one paper, I will sum up by saying that no one should go into the telephone constructing business unless they realize its importance and the duties they owe the public. It is robbery to resort to cheap construction, simply because it works for the time being, thus taking another man's money and after a little depriving him of the service he has paid for. Telephone companies owe it to the public that they do not obstruct ordinary travel and traffic, nor put up contraptions that are dangerous to life and property. Keeping this in mind, the average system will be fairly well constructed.

The chess clubs at Des Moines and Grundy Center, Iowa, recently played a game of chess by telephone. Direct telephonic connections were made between the two cities, and each move was recorded over the wire as it was made. There were eight players on each team.

BILLS BROTHERS SELL OUT AT SIOUX CITY IOWA.

Negotiations have been concluded for the transfer of all the Bills Brothers' stock in the Sioux City (Iowa) Telephone Company to a syndicate composed of the following Sioux City business men: T. Arthur Thompson, E. W. Rice, William Milchrist, George H. Rathman, George C. Scott, W. P. Manley, F. L. Eaton and T. A. Black. These men now own all the stock except about $75,000, which is outstanding among about forty Sioux City business men in small quantities. Fifty Sioux City men now are interested in the company, and about fifty more local persons will be asked to take stock, it is said.

The Bills Brothers' stock amounted to $300,000, while the plant represents an actual investment of $375,000. The company is capitalized at $500,000.

The original officers of the company were as follows: President, C. J. Bills, Chicago; vice-president, Frank L. Bills, Chicago; secretary-treasurer, Fred G. Bills, Sioux City. These men and E. L. Wortham of Chicago, and George T. Hewes of Sioux City, the latter one of the lieutenants of Bills Brothers, formed the board of directors. The new officers and directors will be Sioux City men.

T. Arthur Thompson is to be general manager of the company and will have personal charge of the business.

It is expected the new service will be ready some time in June. Workmen are now setting up the switchboards and making the connections.

TELEPHONE OPERATORS HARD TO GET.

"The problem of securing and retaining the right kind of female labor in the telephone exchanges all over the country has grown more difficult year by year as the service increases and the demands are made more exacting," said the manager of a large Independent exchange. "It will be a matter of time only until every city of size will be forced to have a training school for operators, the same as has been established in New York, Chicago, Cleveland and other cities. This has been found to be economical and much more satisfactory than the old way of teaching a new girl the business.

"But getting the girls who can do their work well, not offend the public and stay with their jobs is what perplexes the exchange manager. In every large city constant study is given the question of what class of girls make the best and most reliable operators. In Chicago the decision has been reached that the Irish-American girls are the best because they are quick-witted, can handle the public easily and hold their tempers. They also remain longer than do girls of other nationalities. But St. Louis declares that German-American girls are the best there.

"Another problem of operating is how to keep the girls interested in their work and the standard of efficiency maintained. In Chicago there are sixteen large exchanges. They compete every month for the honor of the best handled exchange and a prize in the shape of books, which go to make larger libraries that have been started in every exchange and which have proved to be a refining influence with the operators. In other cities the merit system, or graduated pay on the basis of efficiency, has been tried to keep up the grade of work.

"Recent developments have reduced the number of operators in telephone work, but in all kinds of equipment the tendency has been to more expensive and complicated machinery, which is expected to save money in the long run. If present indications are realized, however, new inventions will in the future reduce the cost of operating telephone lines to a small fraction of what it is now."

Arnheim Party-Line Telephone System

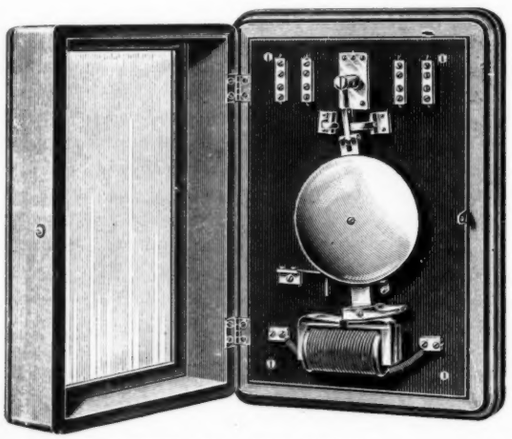
WITH the increased demand for telephonic communication, there is always to be considered the fact that the heavy expenditure entailed in installing telephone exchanges demands that a fairly high price should be paid by the subscriber for the use of the instruments. This has prevented many from using the telephone who would readily have done so had the price been lower.

There are a large number of people to whom the occasional use of the telephone service would prove an extremely useful adjunct both as regards commercial and social requirements, but who do not feel justified in disbursing the amount demanded by the authorities, which is out of all proportion to the return they would obtain by such occasional use. It is, therefore, conceivable that where a number of people, whether residential or commercial, are in close proximity, the aims of engineers should be directed toward providing some means whereby the expense and use of a single line between the main exchange and a group of ten or twenty subscribers could be divided amongst them.

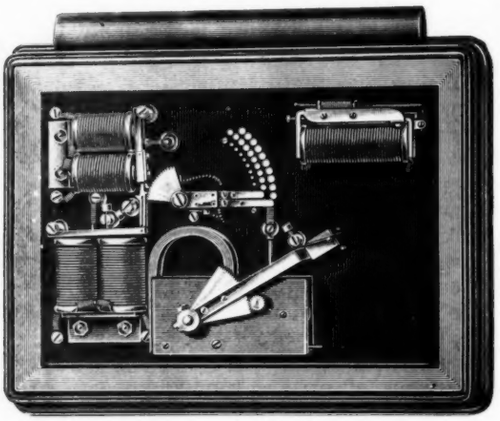
Many such systems have been devised and are known as party-lines. The first efforts in this direction were the connection of two or more telephones on the one line terminating with the usual indicating equipment at the exchange. The method of calling these was by code, such as long and short rings, or a combination of both, in order that the party required might be able to define his own call from those of others.

It is at once obvious that this system presents two very serious drawbacks. First, the subscriber is continually disturbed by the ringing of his own telephone bell when calls are passing through for other people; and, second, when a conversation is going on, any other party on the same circuit can overhear with perfect freedom. The next step was to devise a means of calling each instrument independently of the others by what was known as selective calling systems. This overcame the objection to the needless ringing of the bells of parties who were not wanted, but introduced a very serious objection in the shape of complicated mechanism and delicate adjustment, and, moreover, these mechanisms were situated at each telephone and so distributed over the entire line that the possibilities of breakdown were thereby greatly increased. Further, it did not overcome the objection of overhearing by a third or fourth party. To obviate this, what were known as lock-out systems were next introduced, but by the time all these advantages had been obtained, the whole instruments were a mass of complicated mechanism, needing delicate adjustment and constant supervision. In addition to this, should one party fail to carry out the necessary functions properly, the whole was blocked, and other subscribers were unable to make ues of it until the offending party's telephone had been reset.

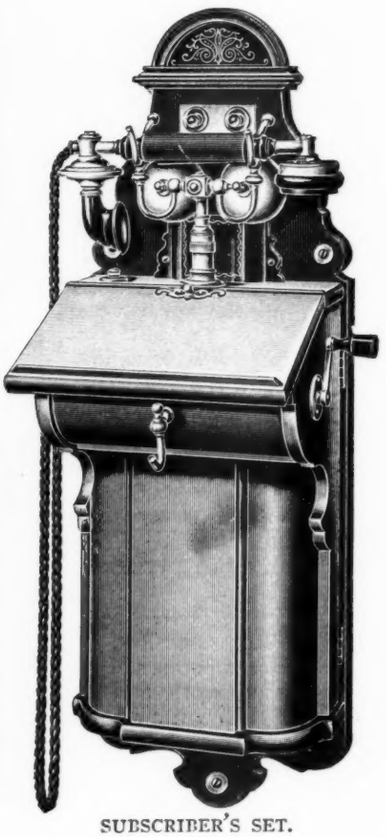
EXCHANGE EQUIPMENT.



CONTROLLING PENDULUM.



AUTOMATIC SELECTOR.



SUBSCRIBER'S SET.

It will thus be seen that the rising tendency was to introduce complicated mechanism, and to sacrifice simplicity for the sake of obtaining perfect results. Experience, however, has shown the fallacy of these systems, and efforts have recently been made with a view to obtaining the same results with much simpler mechanism, and rather to employ electrical and physical phenomena, than introduce intricate mechanical devices; but where it has been found necessary to have a mechanical attachment, it has been the endeavor to have this at one central point. Of the successful party-line systems now in vogue, all have the same great drawback, that only four telephones can be connected to the line. This considerably reduces the cost to the subscriber, but it by no means represents the highest development of the art.

The latest step in this direction has been the perfecting of the Arnheim party-line system, recently introduced and now under consideration by the National Telephone Company and the Post Office Telephone Department of England. The inventor of the system is Herr Paul Arnheim and it is being put on the market by the Berliner Telephone Manufacturing Company. This system is designed for the purpose of supplying blocks of offices, residential flats, etc., with telephones at a cheap rate, and enables the parties connected to it to call up "Central" in the same manner as though they had a line direct to the exchange, without fear of interruption or overhearing of any kind. Where there is a demand for a cheap telephone by people who do not require to be constantly using it, this system will undoubtedly be welcomed.

Single pairs of wires are run from the nearest telephone exchange to the building or district in question; these terminate in a small case containing an automatic selector, from which point radiate as many pairs of wires as there are instruments required. At the exchange end, in addition to the usual line equipment, there is fixed at the operator's position a small dial numbered from one upward, with which the operator selects the required subscriber. There is also an electric pendulum which alternately makes and breaks the circuit.

In passing, it may be said that this pendulum is entirely self-acting, and requires no attention whatever, as its movements are controlled by an electro-magnet, the circuit of which is controlled by the pendulum itself, and so arranged that when the oscillations of the pendulum begin to decrease in force a circuit is closed automatically through the magnet, which attracts the pendulum and so gives it a fresh impetus. In a subscriber's instrument all that is necessary, in addition to the usual equipment, is a small push button with a simple electro-magnet locking device.

We will now consider the method of operation. To call the exchange, the subscriber depresses the push button and lifts his hand-combination from the cradle. This closes the circuit of the pendulum, energizing a relay, which permits the impulses of current given by the pendulum at the central station to actuate the stopping mechanism of the automatic selector, which passes over a number of contact studs until it reaches the line of the subscriber who is making the call. At this point the circuit is cut off and the selector is automatically locked, and simultaneously the push button at the subscriber's instrument rises, giving a visual signal that the line is clear. The subscriber then calls the exchange by using the hand generator of his telephone. If the push button does not rise when the hand-combination is lifted, it shows the line to be engaged. If however, the line is clear, conversation may now proceed. At close of conversation the subscriber gives the ring-off signal to the exchange in the usual manner.

So far we have only dealt with the calling from the subscriber to the exchange. If now a call is made from the exchange to one of the subscribers of the party-line, the operator inserts the plug into the party-line jack in the usual manner, and selects the party required by means of a dial provided with as many finger holes as there are numbers on the party-line. To call, the operator inserts her finger in the hole corresponding to the party required, pulls it round to the stop, and releases it. She then momentarily presses her ringing key, closing the circuit of the releasing mechanism, which allows the dial to slowly rotate back to zero. In so doing a series of contacts are made corresponding with the number selected. This allows a number of impulses to pass out on to the line to the motor generator at the exchange, actuating the selecting relay of the automatic selector as before described, and causing the selecting mechanism to make a number of steps corresponding with the impulses sent.

When the impulses cease, the selector, having reached the required number, is locked, and the final contact made automatically by the hand selector ringing the bell of the party required. When the automatic selector leaves the rest position a timing device is set into action which keeps the connection closed for fifty seconds, during which time, should the subscriber not answer the exchange, the operator may ring him repeatedly. If at the end of fifty seconds the subscriber has not replied, the whole connections are restored automatically, and the operator is set at liberty to select any other number she may require.

If, however, the subscriber answers during the fifty seconds, the contact is locked and conversation may be carried on as long as required. At the close of conversation the hand-combination is replaced, and the ring-off signal given in the usual way. The operation has been detailed only for magneto exchanges, but the system is equally applicable for common battery, and as such is now being tried by the National Telephone Company at their Holborn exchange. The method of operation is exactly the same, except, of course, the generator at the subscriber's instrument is no longer required, and the mere lifting and replacing of the receiver is all that is necessary to originate or finish a call.

In conclusion, we may say that the system has passed its experimental stage, and is now an accomplished commercial commodity.

TELEPHONE COMPANY GIVES "SMOKER."

An enjoyable smoker was recently given to the business men and physicians of Mishawaka, Indiana, by the Home Telephone Company at its handsome modern exchange. The attendance was quite large. President Theodore Thorward and the local lady manager, Miss Inez Hudson, welcomed the gentlemen and provided them with choice cigars. In order to better accommodate the visitors the Prudential Insurance Company opened its office in the front of the building and another office room on the same floor was utilized. The exchange and these two rooms were decorated in white and pink carnations.

F. J. Nelson, who looks after the local line and central work, showed the visitors through the exchange and explained the workings of the various departments. The lady operators graciously assisted in entertaining by explaining the work at the board. The company now has 530 telephones in Mishawaka and the list is rapidly growing. Business men and a number of manufacturers came and went during the evening. The affair was really a love feast, and telephone subscribers and the president exchanged ideas relative to the service there.

The Cuyahoga Telephone Company, of Cleveland, connects with 196,617 telephones in Ohio; the Bell with 104,379. Cuyahoga with 670 exchanges; Bell, 157; Cuyahoga with 1,452 toll stations; Bell, 753. Independent stockholders in Ohio, 17,029; Bell, 408. Capital invested in Independent plants in Ohio, $26,000,000.

Iowa Assessment Law

N. G. GUERNSEY

I PROPOSE first to, as briefly as may be, trace the development of our present law as to the assessment of telephone companies, and, second, to consider the question whether it is a good law, or whether an attempt should be made to improve upon it

Turning to the history of the law in this state, it appears that prior to 1885, and, in fact, prior to the enactment of the code of 1897, there existed no law specifically intended by the legislature to provide for the assessment and taxation of the property of telephone companies in Iowa. Naturally questions as to taxation arose soon after telephone companies were organized and telephone plants were placed in operation here. On October 22, 1885, the Supreme court of the state handed down its opinion in the case of the Iowa Union Telephone Co. vs. Board of Equalization of the city of Oskaloosa, 67th Iowa, page 250.

In this case it was decided that the statute then in force relative to the taxation of the telegraph companies applied to telephone companies as well, the opinion of the court being founded upon the conclusion that telegraph companies and telephone companies are identical. In this case the local authorities in Oskaloosa had attempted to assess the local property of the telephone company named for the purpose of taxation, but the Supreme Court, for the reason just stated, held the assessment void.

In a later case, Franklin vs. Northwestern Telephone Company, reported in the 69th Iowa, page ninety-seven, it was again decided, following the Telephone Company vs. Board of Equalization supra, but under a different state of facts, that telegraph companies and telephone companies were identical.

Under these decisions, and until as a part of the code of 1897 a law specially applicable to telephone companies was enacted, the laws under which they were in fact assessed and taxed were laws that in terms applied only to telegraph companies.

The code of 1873 contained only one section bearing upon this question, section 811, which was as follows:

"All property, real and personal, including their franchises owned by telegraph and express companies shall be listed and assessed for taxation and shall be subject to the same levies as the property of individuals."

This very general statement was the only specific mention in the statutes of the taxation of telegraph companies, until the enactment of chapter fifty-nine of the acts of the seventeenth general assembly, which became effective by publication March 23, 1878. This was an act entitled: "An act to provide for the assessment and taxation of telegraph lines within the state of Iowa, additional to Code Title ten, Chapter six, of telegraphs."

This Chapter six, title ten, of the code authorized the construction of telegraph lines and contained some provisions as to their operation, but nothing on the subject of assessment and taxation.

The act of the seventeenth general assembly provided for a report to be made to the auditor of state and to be by him laid before the state board of equalization, which board was required to assess the lines at their true cash value, and to levy a tax upon this assessment not in excess of the average rate of taxes, general, municipal and local, levied throughout the state during the previous year. This tax, so levied, was to be in lieu of all other taxes state and local and to be payable to the state treasurer. It will be noted that as to the method of the assessment, levy and payment of the tax this law was closely analogous to the telephone law adopted as a part of the code of 1897.

A significant thing about this early law is that its provisions clearly indicate that, at the time, the idea of importing values through the means of what has been called the "unit system" of taxation, as applied to these companies, was then undiscovered. The requirement of the law was that the statement to be filed by the auditor as the basis for the assessment by the state board of equalization or the executive council should show the following facts:

First—The total number of miles owned, operated or leased, within the state, with a separate showing of the number leased.

Second—The total number of miles in each separate line or division thereof, together with the number of separate wires thereon, and stating the counties through which the same is carried.

Third—The total number of telegraph stations on each separate line, and the total number of telegraphic instruments in use therein, together with the total number of stations, other than railroad stations, maintained.

Fourth—The average number of telegraph poles per mile used in the construction and maintenance of said lines.

Note that this law required no showing whatever as to the property of the company outside of the state, or as to its capital stock, or mortgages, but that the facts which the companies were required to disclose were facts tending to show the amount of the tangible property actually owned by them within this state, making the basis of the assessment under this law the value of the tangible property owned by the companies within this state.

This law remained in force until the adoption of the code of 1897, when for the first time a law especially applicable to telephone companies was enacted. As has been stated, the new law followed the old one closely in the method to be adopted in the assessment, levy and payment of the tax. It is found in sections 1328 to 1331 of the code of 1897. It provided for a report by the companies, an assessment by the executive council based upon this report, the levy of a tax by the executive council upon this assessment at the average rate of taxes, state, county, municipal and local, levied throughout the state during the previous year, and for the payment of this tax to the state by the companies. A minor difference was the provision for the deduction from the state assessment of property subject to local assessment and taxed locally. This, I believe, was of little or no importance, because the companies owned little or no property of this character, this provision being construed to include only property not used in the telephone business.

The only radical difference between the code and the telegraph law under which, prior to the code, companies had been taxed, lies in the character of the statement required of the companies as the basis of the assessment. In the report required by code section 1328 each company was required to show the following facts:

1. The total number of miles owned, operated or leased within the state, with a separate showing of the number leased.

2. The average number of poles per mile, and the whole number of poles on their lines in this state.

3. The total number of miles in each separate line or

*Paper read before the Iowa Independent Telephone Association, at Des Moines, Iowa.

division thereof, also the average number of separate wires thereon.

4. The whole number of stations on each line, and the value of the same, including furniture.

5. The whole number of instruments on each separate line, and the gross rental charges per instrument, where the same are rented to patrons of the company making the return, together with the number of stations maintained, other than railroad stations.

6. The gross receipts and operating expenses of said company for the year ending December thirty-first next preceding on business originating and terminating in this state.

7. The gross receipts and operating expenses of said company for the year ending December thirty-first next preceding, and not included in the statement made under sub-section six hereof.

8. The total capital stock of said company.

9. The number of shares of capital stock issued and outstanding, and the par or face value of each share.

10. The market value of such shares of stock on the first day of January next preceding, and if such shares have no market value, the actual value thereof.

11. All real estate and other property owned by such company and subject to local taxation within this state.

12. The specific real estate, together with the permanent improvements thereon, owned by such company and situated outside this state and taxed as other real estate in the state where located, with a specific description of each piece, where located and the purpose for which the same is used, and the actual value thereof in the locality where situated.

13. All mortgages upon the whole or any part of its property, together with the dates and amounts thereof.

14. (a.) The total length of the lines of said company. (b.) The total length of the lines of said company outside this state.

You will observe that in this report many things are required which have little, if any, bearing upon the value of the tangible property of the companies within this state; as, for instance, the gross rental charges per instrument, the gross receipts and operating expenses on business originating and terminating within this state, the gross receipts and operating expenses for the preceding year on business not originating or terminating in this state, the total capital stock of the company, the number of shares issued and their par value, the market value of such shares, the specific real estate owned by the company outside this state, and taxed where located, as other real estate, the mortgages upon the company's property, the total length of its lines outside this state.

By section 1330, in making the assessment, the executive council is required to ascertain the actual value of the property of the company in this state. This is along the lines of the old law. But the council is required to take into consideration, among other things, value of all of the property of the company including its franchises, and the use of the property in connection with lines outside the state. This, on the other hand, looked toward a departure from the fundamental principle of the old law.

These departures from the old law, which required an assessment only of the value of the tangible property within the state, were the result of an effort to apply to telephone and telegraph companies here what has been already designated as the "unit system" of taxation, which has been applied in some states to telegraph, telephone, and express companies, to fast freight lines, and perhaps, in some instances to railroads and other corporations. The capital invested in the particular business is the unit. The value of this is ascertained by determining the value of the capital stock of the company, and deducting from it the capital not invested in the particular business, and so shown not to be a proportion of this unit. The value of the property in any one state is determined by taking the proportion of the total unit which the mileage in that state bears to the gross mileage, and then the value of each mile is ascertained.

It is obvious that the value of the capital stock and the value of the property subject to taxation are not identical. The value of the stock may be affected by skill in management, by general business conditions of depression or prosperity, by stock speculation, and by numerous factors bearing no relation whatever to the intrinsic value of the property subject to taxation. On the other hand, by arbitrarily prorating the amount of the assessment in proportion to the mileage, values may be imported for the purpose of taxation which, in fact, does exist within the particular state in question.

It is not my intention, however, to discuss the merits or demerits of this system of taxation; I have called attention to it as the explanation of the changes which were made in this law at the time the code of 1897 was adopted. The result was a hybrid enactment which was neither a fair illustration of the unit system nor a law that unequivocally provided for the taxation of only the tangible property of the companies in Iowa. It was a compromise and like most compromises was not satisfactory from either point of view.

Shortly after the enactment of the code a controversy arose as to the constitutionality of one of our taxing laws, which was determined by the suit of the Hawkeye Insurance Company vs. French, 109th Iowa, 585, decided by the Supreme court on the 26th of October, 1899. In this case it was held that the provision of our state constitution, section two, article eight, that "the property of all corporations for pecuniary profit shall be subject to taxation the same as that of individuals," rendered unconstitutional any law which did not require the property of corporations to be assessed and taxed like the property of individuals for all municipal and local purposes as well as upon the same basis and at the same rate as the property of individuals.

When the legislature convened shortly after this decision, in January, 1900, it was contended that under the doctrine announced in the French case the law which provided that telephone companies should be taxed by the executive council, and that their taxes should be paid to the state, was unconstitutional, because under this law these companies were not taxed like individuals for school, county and municipal purposes. That this contention was sound, and that the telephone taxing law in the code was void, was later determined by the supreme court in Layman vs. Iowa Telephone Company, 99 N. W. Reporter, 205, decided about eleven months ago.

The vice in the law as it was enacted in the code lay, not in the method of assessing the property of the telephone companies, that is, the method provided for determining the value of their property for the purposes of taxation, but in the mode prescribed for the levy and payment of the tax levied upon this assessment. It was within the power of the legislature to require the executive council to determine the value of the property for the purpose of taxation; what contravened the constitution was for the executive council to determine the rate of the tax to be levied upon this valuation, and the payment of the tax directly to the state.

To meet this objection a bill was introduced by Senator Blanchard and was enacted by the legislature, which amended the law by striking out of it the provisions subsequent to those providing for the assessment of the property by the executive council, and establishing in lieu of them a plan, modelled upon the plan that had been in force for many years as to railroad companies, for the distribution of the assessed valuation as fixed by the executive council among the various taxing districts and for the levy of taxes upon this valuation in these districts by the same bodies, for the same purposes and at the same rates as the taxes levied upon the property of private individuals. This afforded us

finally the basis of our present law for the taxation of telephone companies. The changes since then have been slight and have related not to the general plan, but to merely administrative matters, so that they may be ignored.

Briefly stated the general scope of the law is this. The assessment of determination of the value of the property for the purposes of taxation is made one of the functions of the executive council. The local assessors have nothing to do with this. After the value of the property has been determined there remains the matter if its distribution among the various counties and the various taxing districts. Under the law this distribution is upon a mileage basis. The executive council after determining the gross value of the property in Iowa of one of these companies is not charged with the duty of estimating the amount of this value which lies within each taxing district. It is obvious that to attempt to do this accurately would involve so much in the way of details as to be wholly impracticable. Under the law the gross value of the property of any company is divided by the number of miles of line which the company operates, and the quotient is taken as the value, and in fact is under this determination, the average value of each mile of its line within the state. The number of miles in each county is next ascertained and this multiplied by the value of each mile gives the total valuation for the county in question. This perhaps cannot be better stated than in the language of the law, which is section 1330-b as amended by chapter 45 of the acts of the 30th General Assembly:

"The executive council shall for the purpose of determining what amount shall be assessed to any one of said companies in each county of the state, into which the line of said company extends, multiply the assessed or taxable value per mile of said company as above ascertained by the number of miles in each of said counties, and the result thereof shall be by said council certified to the several county auditors of the respective counties into, over or through which said line extends."

The county authorities take this assessed valuation and distribute it in accordance with the mileage among the various taxing districts in the county and upon this valuation the taxes are levied, the levy being the same as that against the property of individuals in each taxing district.

It is entirely clear that the only difference between this method of taxation and the method that applies in the case of an ordinary property owner is as to the assessment, or, in other words, as to the ascertainment of the value of the property for the purposes of taxation. After this has been done and the values as ascertained have been certified to the proper officers the levy and collection of the tax proceed in all respects as in the case of a private individual.

What has been said outlines the history and general character of our laws relating to the assessment of telephone companies. No attempt has been made to cover details. One important feature may be mentioned, viz.: that the statute expressly provides that the stock of the companies shall not be taxed, thus avoiding the possibility of what would in effect be doubie taxation.

To digress for a moment, it is singular that from the time of the enactment of the first telegraph law in 1878 until the enactment of the Blanchard law in 1900 the statutes of this state relative to the taxation of telegraph and telephone companies were clearly all of them void, because in contravention of the constitutional provision above referred to, involved in both the French and the Layman cases. I do not know whether the fact that during this period these companies paid the taxes assessed against them without protest, as far as I am advised, with the exception of a single instance, is to be taken as an evidence of their indisposition to avoid an equitable public burden upon technical grounds, or as an indication that for once their counsel had relaxed their customary vigilance.

Passing from the history of the law and its development, is the method provided for the assessment and taxation of telephone companies a fair one from their point of view? In considering this question it should be borne in mind that every scheme of taxation that has ever been devised has manifested in its practical operation inequalities. No one has ever yet written a perfect taxing law. Notwithstanding the fact that many inequalities have doubtless arisen under this law, in my judgment the plan adopted as to the method of making the assessment should commend itself to the telephone companies. The question is not whether this plan is perfect either in the abstract or in its practical operation; it is how does this plan compare with any other which might be substituted for it?

In considering what are possible as substitutes the constitutional provision that has been referred to, requiring that the property of these companies shall be taxed for the same purposes and in the same manner as the property of private individuals must always be borne in mind. This practically prohibits any change in the rate of the tax, the manner of its levy, the purposes for which it shall be levied, or the manner of its payment, because in these particulars the scheme of taxation applicable to these companies must be identical with that applicable to the property of private individuals; and any change in these particulars would have to be a fundamental change in the general taxation laws of the state, which would be out of the question. Consequently for practical purposes this inquiry is confined to so much of the law as pertains to the assessment of the companies, that is, to the ascertainment of the value of their property for the purposes of taxation.

Unless there be a departure from what have been recognized everywhere in this country as the underlying principles of all general taxing laws, the value of their properties for the purposes of taxation must be determined and ascertained by some officer or tribunal performing the functions of an assessor. In my judgment there are two fundamental advantages in the provision of the present law which requires this determination to be made by the executive council of the state instead of delegating it to the local assessors.

In the first place the determination of this question by the executive council is more apt to be fair and equitable than if it were determined by a number of local assessors. The executive council is, in the nature of things, more certainly free from those local prejudices and influences which may affect a local assessor. It will be conceded further that the members of the executive council may be expected, because of their ability and experience, to be on the whole better qualified to intelligently determine this question than are the majority of the local assessors throughout the state. In other words, because this method of taxation provides a tribunal free from local influences, and of greater ability and better training than the local assessor, it may properly be presumed that its assessments will be fairer and more equitable than would be those made by the assessors.

The second important advantage accruing from this method of assessment is that each company has to deal with but one assessing tribunal. The property of any company may run through a great many assessment districts. Probably the great majority of the companies in the state own lines in more than one assessment district. No one looks forward to an interview with an assessor with pleasure, though one may possibly sometimes look back upon it without regret. Everyone would rather interview one assessor than two, and would prefer two to a large number. With a number of independent assessors and independent boards of review, assessing different portions of its property, it would be a practical impossibility to secure the adoption of a consistent and equitable method of assessment of all the lines of any company. Some portions would be assessed upon one theory, and other portions upon another. The basis adopted would differ and it would be extremely diffi-

cult to induce any assessor to lower the assessment of his portion because some other assessor had erroneously added too much to the value of the lines within another district. The annoyance and inconvenience incident to a large number of small assessments would prove exceedingly burdensome. The provision, therefore, of the present law, which vests in a single body the power to make these assessments, is an advantage to the companies, the extent of the advantage to each company being in a degree measured by the number of the assessment district through which its line extends.

The practical operation of the law has not been burdensome to the companies. In the Iowa Official Register for 1904 it appears that the executive council placed the value of some lines as low as $8.50, $7.50, $7.00, $6.75 and $5.00 per mile, and one line of sixteen miles was assessed at $2.50 per mile. The total number of companies assessed was approximately 1,202. The property of about 1,037 of these companies was assessed at $1,000 or less. The property of only 165, or 13.7 per cent, was assessed at over $1,000.

On the whole what there is of expense is reporting to the executive council, and attending to the assessment in Des Moines would seem to be more than counterbalanced by the advantages in this method.

As has been indicated the question here ultimately resolves itself into the inquiry, would the telephone companies as a whole be better off if the value of their property were determined for the purposes of taxation by local assessors instead of by the executive council? Would the assessments be more equitable than they are now? In my judgment they would not, but on the contrary it is a substantial benefit to the companies to be placed where they are not required to deal with the local assessors or with the local city councils acting as boards of review.

The impression, if this impression exists, that this law, or to be more strictly accurate, that the portion of this law which requires the assessment to be made by the executive council works a hardship upon the companies whose lines are wholly within a city or town is a misapprehension. These companies, if this provision in the law were eliminated, would be taxed at the same rate at which they are taxed now. The only difference would be that the value of the property on which this tax is levied would be determined by the local assessors instead of by the executive council. Take as an illustration the Mutual Telephone Company of this city, which is assessed at a higher rate per mile than an other company in the state. If its property were not assessed by the executive council it would be assessed by the local assessor and there is no reason to believe that he would place a lower valuation upon it than that fixed by the executive council. The situation as to this company, and those of a like character, is something that inheres in the location and character of their plants. No change in the law could affect the rates at which such companies are taxed upon their assessed valuation or the purposes for which they are taxed, because any law that attempted to do this would be void because unconstitutional under the holdings in the French and Layman cases.

The fact that the assessed valuation per mile of such companies is high does not indicate that their actual assessment is upon a higher basis than that of other companies whose assessment per mile is much lower. As an illustration take the Mutual Telephone Company, and the one whose assessment is nearest to it in the aggregate, the Hawkeye Telephone Company. Their assessments are as follows:

MUTUAL TELEPHONE COMPANY.

Mileage	19
Assessment per mile	$ 986.75
Total assessed value	18,748.25

HAWKEYE TELEPHONE COMPANY.

Mileage	610.75
Assessment per mile	$ 31.00
Total assessed value	18,933.25

If it is borne in mind that the assessment is made by ascertaining the aggregate value of all the property of each company and that the value per mile is only ascertained for the purpose of distributing this valuation through the various taxing districts, it will be obvious that in order to compare these two assessments, or any two assessments, one must look to the gross value of the property of each company. If the gross value of the property of these two companies is about the same then they are assessed upon the same basis, though the valuation per mile of one is more than thirty-one times that of the other.

The Hawkeye Telephone Company with its 610.75 miles pays taxes in many taxing districts, but in the end it pays taxes upon the gross value of its property, at the rate at which the property of individuals is taxed in the taxing districts in which this property is located. The Mutual Telephone Company does exactly the same thing. If the Mutual Telephone Company is taxed at a higher rate upon its property than the rate imposed upon the property of the Hawkeye Company this is wholly due to the fact that the property of each company. If the companies whose property is the rate of taxation is higher than in the localities occupied by the Hawkeye Telephone Company.

These illustrations show that the valuation per mile cannot be taken as a basis for determining whether or not the assessments as between the companies are equitable. This depends upon the gross valuation of all of the property of each company. If the campanies whose property is of substantially the same value are assessed at about the same amount in the aggregate the assessment is equitable. The value per mile is simply a means adopted for the purpose of distributing this valuation throughout the taxing districts. As a matter of fact, however, each company pays taxes upon the total assessed value of its property, paying upon each portion at a rate of taxation that prevails where that portion is located. A company whose property is located within cities and towns pays taxes for municipal purposes just as any other property owner. A company whose property is outside of cities and towns is, as to this property, relieved from these taxes just as other country property is relieved from them.

Upon consideration of the matter I think that you will agree with me that the law does not create any inequality in the taxation of these companies, that in fact there is no inequality, and that what has been considered an inequality is something that inheres in the location of the property of the company which seemed to be at a disadvantage.

In one particular the law should be amended. There should be eliminated from it these characteristics, of what has been referred to as the unit system of taxation, that were injected into it in 1897. The old telegraph law was better in this particular than the present statute. The companies should be required to fully report all property which they own within this state and all facts bearing upon the actual value of this property, but here they should stop. The companies should be taxed, as individuals, upon the value of their property. A company which is well managed and earns profits should not be taxed more than a company which, with property of the same value, but with a less efficient management, earns less money, or loses money. The information required as to dividends, outstanding capital stock, mortgages, gross and net earnings and other like matters, should be eliminated from the reports. This does not bear upon actual value of the property owned by the companies; and to require this information and to go into these questions tends to divert attention from the real issue, the value of the property owned, and to inject into the assessment speculative considerations.

A practical suggestion pertaining more to the making of assessments than to the law under which they should be made may not be out of place. Those who are without experience in the business, and perhaps some of those who have had the benefit of this experience, fail to appreciate the large amount of depreciation that should be charged against properties of this character.

This is due not only to the fact that the ordinary pole and wire construction depreciates rapidly, but also, and to a greater degree, perhaps, to the fact that the state of the art has been such that up to this time the more expensive equipment has not been so standardized as to afford the companies any assurance that their large investments on this account will not within a short time be rendered of relatively little value by reason of changes and improvements in the apparatus. The history of the business is that telephone plants have become old fashioned and so of little value long before they have been worn out.

Applying this to the matter under consideration, in the determination of the value of these plants for the purpose of taxation, age, and consequent depreciation, is a most important factor. Inasmuch as the importance of this factor has probably been underestimated by those who, by reason of their connection with the business, have had it most impressed upon their attention, it would be unwise to assume that the executive council, which is without special experience along these lines, will appreciate the extent of the deductions which should be made on account of depreciation unless a special effort is made to educate its members along this line. It is therefore both desirable and proper that the importance of this question of depreciation be vigorously impressed upon the executive council in all hearings before it relative to the taxation of telephone plants.

One further suggestion may be permitted as to a matter of policy. No assessment is too low. Because the executive council is not infallible, there will of necessity be inequalities in any assessment which it may make. It is a shortsighted policy, however, which permits any company which believes that relatively its assessment is too high to attempt to remedy this by asserting that the assessment of the company which is assessed upon the lowest basis is too low, and should be raised. The effect of this is simply a tendency toward the assessment of all of the companies upon the basis of the assessment which is too high. The company assessed upon the highest basis, intead of attempting to bring the other party to its level should attempt to bring about results by endeavoring to have its own assessment adjusted upon the basis of those which are lower. For the purposes of taxation the lowest assessment is too high and those that are higher than the lowest are much too high. Any other attitude upon this question clearly evidences a shortsighted policy, which will tend toward the gradual increase of all assessments.

"HELLO GIRLS" CANNOT BE SOCIABLE.

The decision of the New York Telephone Company to transfer, so far as possible, the hello girls in its employ to the exchanges nearest to their homes may promote more sociability among them. In the meantime they must struggle along with an undeserved reputation for being sociable. It seems that they are by no means so sociable as the public has been led to believe.

"For some reason or other," said the manager of a central exchange, "the telephone girl's work and ways, her social pleasures, her habits when on duty and off duty, seem to be a subject of never-failing interest to a certain part of the community. This fact has been made use of on occasion to advertise certain entertainments with which the 'hello girls' have had absolutely no connection.

"For instance, I remember having my attention called one day to some hand-bills which proclaimed that on a particular Sunday afternoon a dance would be given at an east side hall, which would be largely attended by the telephone girls from the Cortlandt street exchange. I made a few inquiries and learned that this was the first intimation any of the girls had that they were expected to attend a dance on that day, or any other day, for that matter.

"On another occasion some young men operators at private switchboards and a few of their friends hired a hall, got up a dance and invited, among others, several telephone girls to be their guests, with the result that the affair was reported far and wide as a 'hello girls' ' ball. In all probability, were half a dozen 'hello girls' to appear together at an entertainment the news would be printed that an organization of telephone operators was responsible for the affair."

"With few exceptions," said the head of a telephone school, "the 'hello girls' depend upon their outside environment for their pleasures, not on their business associates, and for this reason telephone operators don't get a chance to become acquainted while on duty. In a large dry goods store, say, or in almost any sort of work room, employes may converse with one another while on duty, and at the lunch hour a great many will meet at the same time under conditions which foster more or less intimacy. Here it is different.

"When on duty the girls are not allowed to talk to each other. One girl may sit for days beside another without exchanging half a dozen words. The two may be in different lunch relays—not more than twenty or twenty-five go to luncheon at the same time—and even if they do go to the lunch room at the same hour they may not sit at the same table. During the rest periods in the morning and the afternoon I have noticed that the girls who meet, instead of getting in a bunch and jabbering, prefer to lie down or lounge in a chair and read. There is no clubbing together, apparently, at any time for social entertainments. Such a thing as a social organization among telephone operators does not exist."

ORIGIN OF THE TELEPHONE "HELLO."

There has been considerable speculation as to where the expression "Hello" as applied to telephone conversation originated. Frederick P. Fish, president of the American Telephone and Telegraph Company, gives the credit to Thomas A. Edison and says that Edison's greatest invention was never patented. "Years ago," said Mr. Fish, "when the telephone first came into use, people used to ring a bell and then say ponderously over the wire: "Are you there? Are you ready to talk?" Well, Mr. Edison did away with that awkward, un-American way of doing things. He caught up a receiver one day and yelled into the transmitter one word—a most satisfactory, capable, soul-satisfying word—'Hello!' It has gone clear around the world. The Japs use it, it is heard in Turkey, Russia couldn't do without it, and neither could Patagonia."

DOCTORS AND RURAL TELEPHONES.

"Doctors don't like the rural telephone," says an Indiana country paper. "It causes the people to delay calling them until the last minute. As many ailments are worse in the evening it increases the doctor's night calls. Instead of coming in after him and returning him, folks telephone and he has to use his own horseflesh to make the call. The old way was to tell the doctor to come back the next day and see the patient. Now he is told that he will be telephoned if needed. The doctors even complain that folks want absent treatment by telephone. They give the doctor their symptoms and ask him to prescribe. One doctor says he has even had them hold the baby up to the telephone so he could hear it cough."

DIGEST OF TELEPHONE LITERATURE

Conducted by Samuel G. McMeen.

Is the Automatic Best?—HIGGINS.—*Telephony, May.*

A paper read before the Engineers' and Architects' Association, Los Angeles, California. A new system usually is considered from three points of view: Its practicability from an engineering standpoint; its possibility from the financial side; can subscribers be shown that it is best for them? The last proposition only is discussed. Mixed manual and automatic systems are not altogether satisfactory, because such a system is more complicated and "people forget to pull dial down to Main in order to get numbers not on automatic and persist in trying to get them automatic, which they cannot do;" all of which may apply to Los Angeles, from which point this article hails, but which would not seem to apply to some modern plants of the middle west. The proposition under discussion, then, is considered by comparing automatic and manual systems from the following points of view: Secrecy; simplicity of operation; correctness of connection called for; speed in answering, disconnecting and making connections; information desired; possibility of completing connection; liability of apparatus being out of order; party lines; special equipment; private branch exchange; the subscriber's telephone set; the line connecting central and substations; protection from dangerous sources; facilities for balancing operators' work; signaling apparatus, subscriber to operator; testing called line for busy test; means for connecting two lines together; means for signaling operator during a conversation; means for disconnection on signal; operators.

EQUIPMENT.

Ventura, California, Plant—HIGGINS.—*American Telephone Journal, April 22.*

This town has a population of 3,000, and the new Independent exchange opens with 140 lines working, the Bell having 300; a rapid increase is expected with the expiration of Bell contracts. Three illustrations are given, all interior central office views.

Wichita Exchange—M'VEY.—*Sound Waves, May.*

The Wichita company owns its building, which was designed especially for the exchange, lines are underground in the business district and Sterling multiple lamp signal switchboard is used, with a capacity of 2,100 lines. Operation was begun in October, 1902, with 600 telephones against the Bell's 1,200; to-day the Wichita company has over 2,600 telephones, against the Bell's 300. Of the 2,600 telephones, 670 are four-party selective. Flood troubles are recounted, and the present condition and organization reviewed.

The Telephone in the Making—SMYTHE.—*Telephony, May.*

Great care and skill is needed and used in the making of the various parts of the present telephone equipment. In the making of the transmitter an accuracy greater than in the making of a watch is required. A transmitter comprises 150 pieces.

Automatic in Vienna—Electricity, May 17.

Since April 1, a 200-line automatic exchange on the Strowger system has been in use experimentally in Vienna, provision being made for extension if the experiment prove successful.

Probable Automatic Development—Western Electrician, April 29.

It is recited that Herbert Laws Webb has said that the probable future development of automatic telephony would be to keep the substation at its present state of simplicity as attained in central energy systems and to use automatic devices at central where they would be under the control of experts.

Arnheim Party-Line System—Electricity, May 3.

An ingenious party-line system has been placed on the market in England. Each party line constitutes in reality a branch exchange, with individual circuits radiating to the substations of the line and with one trunk line connecting to the main exchange; this branch exchange, or junction point of the party line, consists of a selector switch adapted to connect the trunk line to any one of the radiating substation lines. By taking the telephone from the hook and pressing a button, the subscriber at a substation telephone may cause the selecting switch to connect the trunk line to his branch line, thus connecting his telephone to the exchange, if the line to the exchange were not busy at that time; thus when the exchange connection is used by one substation, the others are unable to interrupt or to listen upon the conversation. To call any station upon such a party line, the operator sends over the line the proper number of impulses, thus stepping the automatic selecting switch to make connection with the desired substation line; an advantage in this feature of the system is that but one such stepping device is used for the line, though there may be ten or more stations upon it. The method of connecting a calling station to another station of its own party-line group for conversation is not shown.

Telephone Aid for Sermons—Western Electrician, April 22.

In the First Baptist Church, in Chicago, transmitters were installed in the pulpit and wires were carried under the carpet, eight lines being run to eight receivers such as those who were "hard of hearing" could hold conveniently while sitting in their pews. The pastor spoke in his usual tones and the sermon was heard through the telephones by persons who never had been able to hear his sermons before. The installation was entirely concealed from view, with the exception of the receivers.

Central Office Equipment for Long-Distance Work—Western Electrician, April 29.

Excerpts from the report of the committee on standardization of equipment, read before the Ohio Independent Telephone Association. It is considered better to have the toll operators at the main board when there are but two or three of them.

Sources of Ringing Current—DRAYTON.—*American Telephone Journal, April 22.*

The hand generator for the switchboard is sufficient until the number of subscribers gets into the hundreds and the operator gets so busy that she has not time to turn the crank when making each call. Good service then demands that she be able to ring the subscriber by the pressure of a key. For continuous ringing current supply, a magneto generator may be belted to a motor or to a shaft in a mill or shop, preferably one near the exchange, or a pole changer may be used with battery as a source of energy. The first cost of a pole changer is usually less than of a good magneto generator equipment, and the service is more reliable. The circuits of a pole changer are given, as are also diagrams of ringing motorgenerator and dynamotor. In exchanges where tone busy and other tone tests are used, the dynamo or magneto generators are preferred.

High Tension Telephone—Journal of Electricity, Power and Gas, April.

A telephone equipment made by a Stockholm firm is designed to overcome the danger of high-tension currents

where the telephone line is on the same pole lead with a high-tension transmission line, as is occurring more and more frequently in modern power transmission practice. The instrument is of the magneto signaling type, designed to be fixed on the wall high above the reach of the user, and has the receiver and transmitter at proper height for use and connected by wires heavily insulated. The hook switch is controlled by a cord and weight, and the generator is driven by a belt and pulley with crank at accessible height.

Telephone Extension Circuits—CLAUSEN.—*Sound Waves, May.*

Circuits 41 to 48 are shown in this installment and are devoted to common battery installations with central office and substation equipment of the Bell type, in each circuit there being two substations and a line connecting with the central, the variations being rung upon the abilities of the stations separately to call each other or the exchange, or not, and the ability of the exchange to call one or both the substations.

Frontier Company Sold—Electricity, May 10.

The transfer by purchase of the controlling interest of the Frontier Telephone Company (Independent) of Buffalo, New York, to the Consolidated Telephone Company, which latter company, with its capitalization of $10,000,000, controls some fifty telephone companies in that territory, tends toward a unification of the Independent service, which should improve it and greatly increase its advantages in competition with the Bell service.

FINANCE AND ECONOMICS.

Electric Lighting by Telephone Companies—Telephony, May.

Four instances are cited in which a local Independent telephone company is furnishing electric light service in connection with its business of furnishing telephone service, or in which steps are being taken to that end.

Chicago Telephone Rate Litigation—Western Electrician, May 20.

A review to the date of the article of the conditions leading up the suit of Illinois Glass Company against the Chicago Telephone Company (Bell) for a rebate of $50 per year per telephone charged by the company over what is claimed to be the ordinance rate; with similar suits pending, the amount involved is some $2,000,000. The telephone company maintains that the rate of the ordinance applies to grounded-circuit or single-wire lines, and that the additional $50 per year per telephone is a reasonable extra charge for metallic service.

South American Electrical Trade—Telephony, May.

A review of the opportunities and conditions for traffic in telephone instruments and supplies with Mexico, Central American and South American countries.

Independent Telephone Situation in Detroit—Western Electrician, May 6.

The Co-Operative Telephone Company has been reorganized for the purpose of giving local service, and the peninsular company, a toll-line company, plans large expenditures for toll lines for Detroit service. The local Independent rates are fixed by ordinance.

Lorimer Automatic Organization—Telephony, May.

A trust deed for $2,000,000 has been filed at Troy, Ohio, by the Lorimer Automatic Telephone Company, successor to the American Machine Telephone Company, and owner of rights to manufacture and sell the Lorimer system of automatic telephony. As indicating the preliminary steps to the commercial development of the Lorimer system, this event is of considerable importance in the Independent telephone field, and is of general engineering interest as well by indicating an early and thorough trying out of the Lorimer system.

New York and Boston Rates—Electrical World and Engineer, May 6.

A statement of the latest of the new rates for these cities is given, including measured service rates tabulated.

Independent Telephone Securities—MOELLERING.—*Sound Waves, May.*

A good evidence of the value of any security is the estimation it receives in its home market; therefore, bonds and stock of Independent telephone companies can be classed as high-grade securities. The successes of the past ten years predict successes for the future.

Henderson, North Carolina, Telephone Directory—Telephony, May.

A new directory just issued serves as an index to the development of the Atlantic coast. The book covers thirty-one exchanges with some 6,000 subscribers, and contains a map showing 3,000 miles of Independent toll lines.

Big Independent Incorporation—Electricity, May 17.

The Great Eastern Telephone Company, capitalized at $30,000,000, has been incorporated in South Dakota. A branch office will be established in New York city. The new company is identified with several large eastern Independent interests, and seems to indicate a merging of interests to invade New York city and otherwise develop Independent telephony in the east.

Independent Progress in Nebraska—Telephony, May.

A reprint of an article from the Omaha World-Herald. A review is given of the conditions present and past of Nebraska communities where Independent telephone systems have been introduced. The entire article leads up to the introduction of Independent telephony into Omaha as an act of self-preservation in view of the network of Independent toll lines and Independent exchanges surrounding it.

Telephone Toll Rates in Great Britain—Electrical Review, April 22.

An interesting table is given relative to telephone toll rates in Great Britain and Ireland. A few figures given are: London to Birmingham, 105 miles, 42 cents; Plymouth, 200 miles, 68 cents; Belfast, 404 miles, $1.46; Cork, 619 miles, $2.06. The length of the connection in minutes for which this charge pays is not mentioned, but compared with the three-minute rates of the long-distance (Bell) company of the United States for similar distances the differences are striking.

The Farmer—WING.—*Finance, May 13.*

From a paper read before the Michigan state convention. A change in the telephone business has been wrought by the farmer; to-day he is the foremost customer. Farmer lines entering a village form the most solid basis for an exchange. In building rural lines as much care should be used as in city lines. To estimate business, count up the houses and figure on ninety per cent of them being customers. The farmer remote from town prefers a line with twenty telephones so he may listen and get the news; such a line should be designed to have stations ring each other without ringing central, and vice versa. In soliciting rural business, no promises or representations should be made which will interfere with present or proposed toll line tolls: the farmers should be a profitable source of toll line revenue and will be if properly started and educated. Average farmer rates are too low, but with properly nursed toll business the farmer lines are profit makers.

TRAFFIC AND OPERATING.

Swearing Over the Telephone—Telephony, May.

Editorial notice of recent events in this line, and of the attitude of the Chicago Telephone Company on the general subject.

Telephone Clock in Paris—Electricity, May 17.

The Paris telephone administration has introduced into its public telephone pay-stations a clock which is set going at the beginning of the conversation, that the person talking may see how long he has used the telephone. Apparently a progressive thought.

Emblem for Independents—Telephony, May.

A discussion of this important subject now engaging the minds of active Independent men, and likely to be decided at the coming National Independent convention in Chicago.

Three designs are illustrated in the article, the well-known shield and the Maltese cross, and also a new cross design formed of the letters I and T, the initials of Independent telephony.

The Telephone System of To-day—WOODBURY.—*Electrical Review, May 13.*

Abstract of a paper read before the Brooklyn Institute of Arts and Sciences. The subject is discussed in the following subdivisions: Administration; lines; switchboard; development; operation; toll service; rates.

Management of a Telephone Exchange—STINSON.—*Electrical Review, April 29.*

A paper read before the Ohio Independent Telephone Association. The entire subject is covered in a general way.

Increasing Long-Distance Business—OVERLY.—*Finance, May 6.*

Read before the Ohio Independent Telephone Association. The quality of long-distance service can be increased by providing a sufficient number of circuits, and maintaining them and all telephones and operating and repair forces in good condition. Good service from good lines and good instruments will increase the volume of business; prompt service from an efficient operating force will increase the volume of business; the use of good signs will increase the volume of business.

The Theory of Probability Applied to Telephone Traffic—Western Electrician, May 6.

A report of a paper by Malcolm C. Rorty, superintendent of traffic of the Central District and Printing Telegraph Company (Bell), of Pittsburg, Pennsylvania, read before the American Institute of Electrical Engineers. The practical application of mathematical curves of probability frequently will kill a false system in its inception, thus avoiding much experimental work. Curves were shown in connection with the reading of the paper, but these curves are not reproduced in this report.

The Telephone Girl—Telephony, May.

A study of the telephone girl, her influences and conditions, written in a popular strain. The girl at the switchboard is always young; she can get in at seventeen and rarely stays beyond twenty-four, and if she does she usually leaves the switchboard to become chief or monitor. Romances are frequent and matrimony is a much used door opening outward. Deserters are quickly replaced with new workers, each one being carefully schooled by trained teachers before she is permitted to take her place at the active switchboard.

Operator's Efficiency and How Gained—CHESTER.—*Sound Waves, May.*

The importance of proper distribution of traffic on the switchboard and the proper distribution of operators at the board is of importance and is becoming more fully comprehended. Peg counts are necessary in the attainment of this end. A busy operator gives better service than one who has idle time between calls. As far as possible operators should be paid on a basis of merit founded on her ability to receive and answer calls.

Four-Party Selective Lines—EVERETT.—*Western Telephone Journal, May.*

This is the story of the successful introduction of four-party selective service into a Nebraska exchange to solve a problem in the growth of the exchange, with an increase of profits. The matter of rates was involved chiefly, and by the introduction of the party line the company was able to comply with its franchise, to provide for growth in number of subscribers at a minimum of investment, and to increase its gross and net revenue.

Telephones in Power Transmission Plant—Western Electrician, April 29.

A hydro-electric plant is located at Lowell, Kansas, from which point a transmission line leads through the Missouri lead and zinc mining district, by the cities of Galena, Joplin and Webb City, in all about thirty miles; four substations were constructed, and from them secondary transmission lines lead to mines to be supplied with electric power. A voltage of 33,000 is used on the main transmission line, and 2,300 on the secondary lines. A private telephone system has been installed, with telephones located in the substations and at the main power house. The telephones are very carefully insulated from the walls and insulated stools are provided for use when talking over the telephone. For lightning protection, a 2,000-volt arrester is installed where the telephone line enters the building; the telephone line then passes through ordinary telephone fuses, heat coils and carbon arresters. A double-pole knife switch is installed at the telephone instrument by which the instrument may be disconnected entirely from the line, an extension bell being permanently connected to the line for receiving signals while the telephone is disconnected.

LINES AND CONSTRUCTION.

Telephones in Australia—Telephony, May.

Experiments are being made looking toward the establishment of long-distance telephone lines in Australia by equipping existing telegraph lines with composite apparatus.

Telephone Construction Practice—MINHINNICK.—*Telephony, May.*

Chapter IV. in the series of articles. In selecting the duct to be used, many types will be found on the market, all of which can show successful installations, and none of which may make any serious claim to being electrolysis-proof; the choice, therefore, seems to rest upon the matter of price, and in this, since it is the author's experience that the cost of laying the different types of duct does not vary greatly, the decision seems to be wholly one of the cost of the delivered duct. This reduces the problem to its simplest terms. The original method of laying cable was to build a box in the trench, put the cable in, fill with a bitumen compound, cover the box and fill the trench. The first conduit introduced was the pumplog, and when thoroughly creosoted it seems durable; the next was cement-lined pipe; vitrified clay duct, and paper or fiber duct are the more modern ideas. Vitrified tile in single ducts usually comes in 18-inch lengths, which are laid up in mortar like brick, and the handling requires skilled masons; some of the largest and best installations in the country are laid with single-duct clay tile. Multiple duct vitrified clay conduit is made in two or more ducts and in lengths of eighteen inches to six feet. Small holes for dowels are made in the partitions between the ducts to secure alignment. Fiber or paper duct is lightest of all and easiest to handle. It is made of paper or fiber and is impregnated with an asphaltum compound. Cables draw easily through the smooth walls of these ducts. Such ducts must be set surrounded with concrete. Stone conduit is made from cement and crushed limestone and is laid as is paper or fiber duct. Another method of conduit construction is the building of concrete conduit in the trench by pouring concrete over mandrels and withdrawing the mandrels after the concrete has hardened, thus eliminating the cost of factory-made duct altogether; an important installation of this type of construction is at Waco, Texas. There are general principles of construction which apply to any form of conduit: The ducts must be continuous between manholes, should be nearly straight, so graded that water will not collect between manholes, must be protected against mechanical injury, must enter the manholes in a manner to permit the placing of cables, the manholes must be of ample size and strength, etc. Well made plans and well organized work gangs are needed for these results. The making of such plans and such organization is gone into with considerable detail. A crew of sixty-two men and three teams is listed as being able to lay 20,000 duct feet per week, including the building of manholes, where asphalt pavements are not required to be torn up.

Government Telephone Cable to Beaver Island—Telephony, May.

Editorial report of the proposed installation of a cable for telephonic communication with Beaver Island, the largest island in Lake Michigan. This telephone cable will be twenty-six miles in length and will be used principally for the transmission of weather bureau intelligence.

New York Central's Long-Distance Telephone Line—Telegraph Age, May 16.

The New York Central & Hudson River and the Lake Shore & Michigan Southern roads now have in use a telephone line of their own from New York to Chicago, over 950 miles, with a branch to Youngstown, Ohio, which is extended by the Pittsburg & Lake Erie to Pittsburg. This plant is owned by the railroad companies and is operated under contracts with the American Telephone and Telegraph Company and the local telephone companies in the several cities where local private branch exchanges are established. The line is No. 8 B. W. G. hard drawn copper transposed every half mile. The circuit is provided with switching facilities at half a dozen different points where local private or private branch exchanges are established. Also, it is cut into test offices at intervals varying from twenty-five to fifty miles throughout its length; in normal operation, no apparatus is connected to the circuit at these test offices. The telephone line is placed on the top cross-arm; on account of the greater strength of the telephone wires they are usually the last to break in a storm, and therefore will be in trouble less if placed above the weaker telegraph wires. The American Telephone and Telegraph Company now has contracts with railroads operating long-distance telephone lines on 5,400 miles of railroad, the length of the telephone circuits being about 6,000 miles, and fourteen different railroad companies being involved.

Telephone in Government Service—Electrical World and Engineer, April 29.

Through the weather bureau, the government now is distributing forecasts and special storm warnings by telephone practically to everybody in the United States. With the growth of the rural telephone line it is expected that eventually almost every American farmer will receive the daily weather forecast in his own home. In some districts the organization already has been made. The day is not far distant when the rural telephone will become an important factor in the delivery of rush letters. Senator Fairbanks proposed that a special stamp should be sold for ten cents which would authorize the receiving postmaster to open the letter and read its contents over the telephone to the person addressed. The plan was objected to because it was feared that it might commit the government to large telephone rentals. Even now, however, by securing permission from the postoffice department, a postmaster may arrange with his patrons out in the country to open their letters and read the contents to them over the telephone.

GENERAL.

Conversion of a Telephone Exchange from Magneto to Central Battery System—COHEN.—*Electricity, April 26.*

First paper. The first requirement is a study of the magneto exchange and its traffic and relations to other exchanges that the requirements of the new common battery equipment may be determined by the engineers. The design of the new central office being settled, the selection of premises for it follows, and whenever possible the premises should be designed specially for the exchange. Floor plans of North switch room, London, and of the apparatus room of Norwich exchange, are given, also a view of the Holborn intermediate distributing frame and cable rack.

Conversion of a Telephone Exchange from Magneto to Central Battery—COHEN.—*Electricity, May 3.*

Concluding paper. The precautions required at each substation are the insertion of a condenser in the circuit of the call bell to prevent the operation of the line signal circuits through that path, and the proper poling of the receiver, that the magnetism produced by the current from the central office battery may supplement the magnetic field of the permanent magnet of the receiver; with these two details, the magneto, local battery instrument will operate satisfactorily on the central battery line until such time as the new central energy instrument may be placed in service. Condensers are also inserted in series with all extension bells, drops or other switching or signaling devices at the subscribers' stations. The testing out of the new exchange before placing in service must be thorough and complete. During the time intervening between the installation of the new exchange and the actual placing of the exchange in service, the two switchboards, new and old, are necessarily both connected to the same telephone lines, each telephone line after leaving the substation either branching to the two switchboards or passing through one and thence to the other. These two systems of connecting on the new switchboard are called by the author the teed-in method and the looped-in method. Both methods are shown in diagram and seem fully described, both before and after the placing of the new switchboard in service, as well as in the operations necessary at the time the change is made. The actual change from one switchboard to the other should occupy but a few minutes, even in a large office, the switchboards being connected to the lines by means especially designed with a view to that end. All of these details are carefully mentioned, and specific cases are cited in each instance from English practice.

Mexico May Not Have Long-Distance Telephones—Telephony, May.

The longest telephone service in Mexico is eighteen miles, from Mexico City to Tlalpam. The Federal Telegraphs have the right for transmission of quick messages from one political division to another in a manner that precludes the telephone companies from infringing. The telephone lines radiating from a city to its suburbs must stop when the limit of the political division is reached, as they may not cross into any of the surrounding states.

Telephone Cash Carrier System—Telephony, May.

Peoria, Illinois, seems to have taken the initiative in a novel experiment, the exact detail of the method not being clear. Telephone stations, each manned by an inspector and a cashier, are distributed over the store, and by their use the shopper is given her package and her change.

America Leads in Telephones—Finance, May 13.

There are in America more telephones than in all Europe. The total telephone investment in Great Britain and Ireland, $40,000,000, does not exceed the amount spent annually by the American Bell in improving and extending its plant. Common battery switchboards have been in use in America for years; they are just now being introduced into London. Underground construction methods are equally as far behind American practice. The private branch exchange is almost unknown to the English business man, and the first hotel system in London was installed within the past year. There are few residence telephones and no farm telephones. From all Europe, telephone builders come to America when they want to improve their systems.

Telephone on National Target Range—Electricity, April 19.

The installation of a complete telephone system at the national target range, two miles north of Junction City, Kansas, has been completed. Telephone connection is made with each firing point and with each target. The target range telephone system is connected also with the military post and with the city.

Telephones on Shipboard—Electrical Word and Engineer, May 13.

The application of telephones to use on steamers is a different and more difficult problem than on land, as the vibration of the ship has an effect upon the operation of the apparatus. The difficulties have been overcome, however, and modern steamers have complete telephonic equipments. Two elaborate telephone systems are now being installed on the steamer Dakota, now under construction. One is an exchange of the ordinary type, with 150 stations in various parts of the boat, and with a station in each room; the other is an intercommunicating system for the boat's administration.

Railway Composite Systems—WILDER.—*Sound Waves, May.*

Chapter III. Considerable work has been done in Europe during the past few years in compositing telephone and telegraph circuits. In most of the European countries the telephone and telegraphs are under control of the government and there is a better field for co-operation between them. The composite circuits working between Brussels and Paris are taken as representing the average and are illustrated and described.

Duplexer Phantom Circuits—ADAMS.—*Western Telephone Journal, May.*

The duplex or phantom circuit is coming to be used by Independent companies. Bell companies have been using such circuits and are now using them in many places without the public knowing anything about it. From the financial standpoint such circuits offer alluring returns. One of the simplest methods of duplexing is to bridge a split repeating coil on the metallic telephone line. This leaves the metallic telephone line just as before for the same telephone service, and gives one phantom conductor which may be used for telegraph or for signaling purposes or for a grounded telephone circuit. Two such phantom conductors may be used for a metallic circuit phantom telephone line, thus giving three metallic telephone circuits for four single wires on the pole line. With such an arrangement, a short-circuit on either of the original metallic pairs will not disable the phantom line. Equipments for installing such circuits may be bought in the open market. Four figures are given illustrating phantom circuits.

Telephone Improves Human Voice—KENNEY.—*Telephony, May.*

Mr. Kenney, a Boston voice instructor, is of the opinion that the telephone is destined to modify the American voice. He comments also that there is room for improvement.

Amusement Telephones in Brooklyn—*Telephony, May.*

The Orpheum theater, Brooklyn, in connection with the local telephone company, is engaged in an experimental test. A transmitting apparatus near the stage is connected to a line to the telephone central office, whence the transmitted sounds may be distributed to a number of patrons. It is possible that if the experiments are entirely satisfactory the service may be installed as a permanent feature.

The Trouble Shooter—PACKARD.—*Technical World, June.*

A write-up in a popular strain of the "physician in ordinary" to the telephone, with illustrations in the same strain.

Hesketh's Views of Telephony in America—*Telephony, May.*

John Hesketh, electrical engineer of the Postmaster's Department of the State of Queensland, in a newspaper interview, has said that America undoubtedly leads the world in the development of telephone business; that in Europe the best work is being done where American experience is being followed; that there is no limit in sight to the number of telephones which may be placed in use, and a development of ten to twenty per cent may be attained where the principal factors are provided for, viz., efficient service, a graduated tariff, and the education of the public in the value of telephone service.

Large German Exchange—*Western Electrician, May 6.*

An exchange of 50,000 subscribers will be opened at Hamburg in the course of the present year; this will be the largest in Germany. The cables will be underground and present overhead wires will be removed.

Wireless Telephony—*Telephony, May.*

An article reviewing very briefly the work of Bell and Ruhmer and the possibility of modifications of the existing systems of the Marconi type of wireless telegraphy, and concluding with the statement that it may be taken for granted that while the wireless telephone in everyday business is one of the certainties of the future, it is still only a scientific demonstration and it may remain so until it is developed by some idea which has not yet entered into the experiments with it.

The Telephone—HARRISON.—*Electricity, April 19.*

The success of a local battery telephone system depends upon the employment of the induction coil, by means of which the pressure of the outgoing current is raised. Details of such a coil are given. The magneto generator also is described in some detail, with diagram. Although a magneto generator for each substation is not required in a central energy signaling system, the magneto call bell, or polarized call bell, adapted to operate on alternating current and without interrupting contacts in its local circuits is the best for signaling the substation from the central office. Such a call bell is shown in diagram and its operation briefly explained. Substation circuits for local battery transmission and magneto signaling are given, the automatic shunt for the generator is discussed and the principle of the multiple switchboard is taken up and made clear by a simple diagrammatic illustration.

Telephony—*Electrical Review, April 22.*

A report of the fourth lecture of Herbert Laws Webb before the London Society of Arts.

The Ohio Convention—*Western Telephone Journal, May.*

Report of the convention, giving in full the addresses of President Beam, Col. F. S. Dickson and James B. Hoge, and giving articles taken from the papers of Dwight E. Sapp on "Development of New Territory and Importance of Placing Properties on a Dividend-Paying Basis," W. F. Laubach on "The Importance of Having Manufacturers Protect Independent Interests by Not Selling to Companies or Individuals Desiring to Compete with Existing Independent Companies," C. E. Stinson on "Practical Management of Maintenance and Operation of a Telephone Exchange," F. V. Newman on "Toll Station Reports" and by N. F. Wing on "Our Friend, the Farmer."

Trans-Continental Telephones—*Electrical World and Engineer, April 29.*

An Austrian official has notified an official of Tyrol that in September next direct telephonic communication between Verona and Trent will be accomplished. This leaves but a short gap to be bridged to make possible direct telephoning between Rome and Berlin.

Locating Concealed Manhole Covers—MCGREGOR.—*American Telephone Journal, April 22.*

When streets are covered with ice or snow considerable trouble and delay may be encountered in finding a desired manhole. If the manhole cover be of iron, a compass needle will assist in locating it. The modus operandi is given in detail, with diagrams.

Signal Corps Service in the Philippines—*Sound Waves, May.*

"Ex-Soldier" writes of his three years of experience with the signal corps of the United States army at the beginning of the troubles in the Philippines. The maintenance of telephone and telegraph lines in the islands presented peculiar difficulties; wires were stolen by natives and poles eaten off by white ants, and the disposition of the belligerent natives to destroy for the purpose of inconveniencing the soldiers was a further trouble for the guardsman of the lines, whose orders were to shoot when a native was seen molesting the line. The telephone commercially is making much headway, and a number of Filipino, Spanish and Chinese business houses have adopted it.

The Growth of the Telephone—TERRY.—*Telegraph Age, May 16.*

The general subject is covered in a popular strain, from the invention of the telephone and the construction of the line between Boston and Lowell, three years later, to a review of the magnitude of the telphone traffic of the present day.

Conflagration in England—*American Telephone Journal, April 22.*

A recent fire in London destroyed the test room of the Bank exchange and the distributing room at Oxford court. The switchboard was not damaged except by water and in a remarkably short time service was being given. A contact with a live trolley conductor is blamed for the trouble.

Two views are given, showing the Bank exchange terminal room and the Bank exchange wire tower after the fire.

Wireless Telephony—Telephony, May.

An account of some experiments by Pennsylvania investigators, who may produce results worthy of note later. A wire with transmitter and battery was strung between grounded terminals forty feet apart; a similar wire with receiver was strung parallel to the first and thirty feet distant from it, being also between grounded terminals; speech in the transmitter was heard in the receiver, as were also the clicks of the opening and closing of the battery circuit. While the experiment was over a distance of only thirty feet, it is intimated that voices might be heard successfully as far as half a mile. "The discovery is as yet of little commercial value." Other experiments will be tried later.

Efficient Lightning Protection—DOBBS.—*Sound Waves, May.*

Second paper. The "bound charge" is explained at considerable length. Explanations of certain phenomena are given, and cable protecting methods are discussed. In bringing a telephone line to a lightning arrester, the line wires should be brought straight, without curves, corners or curling, and from the arrester to the telephone the conductors may run indirectly if desired.

Telephone Courtesy—Telephony, May.

The United States government has called upon its weather officials to be very courteous and polite in answering telephone calls, and has issued cards with instructions to post near the telephone, reading as follows: "Remember that a hasty reply or a discourteous remark gives the public an unfavorable impression of the weather bureau officials on duty at this office." This action is typical of the growth of appreciation of the importance of the telephone as a means of revealing the personnel of a business. With increasing familiarity of the general public with the telephone, the nature of a telephone conversation rapidly approaches that of a personal call; the same ideas and impressions are given and received, and the same courtesy and care is needed to give and preserve those impressions. The official recognition by our government of this phase of telephone service is worthy of note.

CAESAR AT THE TELEPHONE.

Flushed with victory, Col. Julius Cæsar left the scene of the battle and hurried to the nearest telephone booth.

"Hello, central," he said. "Give me Rome."

"A little louder, please," said central.

"Give me *Rome.*"

"Stand closer to the telephone, put your lips against the receiver, and speak in a firm tone," ordered central.

"Think I am going to climb into this thing?" asked Cæsar. "You connect me with Rome or there'll be another magazine article provided for around here, with you as the central illustration."

"Here's your party," was the only reply.

"Hello!" yelled Cæsar. "Is this Rome?"

"Yes."

"Gimme the palace."

The connection was made.

"Hello? Is this the palace?"

"Yes."

"Who is this?"

"Horatio Claudius, the messenger."

"Hello, 'Ratius. Know who this is?"

"No, sir."

"Guess."

"I can't guess. Who is it?"

"Don't you know my voice?"

"No. Who is it?"

"Aw, can't you guess who it is?"

"Tell me who you are and what you want, please."

"Well, that's a joke on you."

"Who is speaking, anyway?"

"Why this is Cæsar."

"Sneezer?"

"No! Cæsar."

"Geezer? Who in the wo—"

"Cæsar! C-A-E-S-A-R! Dadgum you! Can't you hear thunder? Julius Cæsar! Me! It! The whole thing! Got it now? Understand whose yelping at you?"

"Yes, sire."

"We've just won a great battle—"

"Great rattle?"

"No! Confound your muckle-headed ears! B-a-t-t-l-e! Get that?"

"Oh, battle. . Thought you said—"

"Never mind what you thought. I'm doing the thinking for this community just now. We've just won a great battle, and I want you to put a bulletin on the walls of the city where everybody can see it."

"Yes, sire."

"Better write it down now, so you'll get it right. Listen, now. Are you ready?"

"Yes, sire."

"Well, say, 'Veni, vidi, vici.'"

"Yes, sire; I have it. Beany, bidy, bicy."

"No, no! Veni, vidi, vici!"

"Sheeny, shidy—"

"Great heavens! Were you never at school? Veni, vidi, vici."

"Oh, weeney, widy, wicy. I'll go and tell Mrs. Culphurnia—"

"Here! Wait! You haven't got it at all! I said Veni, vidi—"

"I have it now. Clean eye, cried I—"

"Now, by the shade of Mars, this is too much! Out upon thee, dog! Would that my fist could reach thee, even as my voice doth! Back to the woods!"

"Tell it me once again, and I—"

"I'll tell you to—"

Here central broke in, saying:

"Did you get your party?"

Then did the royal rage of the late J. Cæsar manifest itself, and the telephone building was scattered over the plain, while the central girls fled shrieking for home and mother.

And thus it was that the loyal populace of Rome must needs wait until the slow feet of a messenger brought them tidings of the glorious victory.—Chicago Tribune.

NEW YORK CITY TELAUTOGRAPH FRANCHISE.

An application has been made to the New York City Board of Aldermen by the New Amsterdam Telephone Company asking a franchise to lay conduits and erect poles in all five boroughs for the operation of telephones, telegraphs and for telautography. The ordinance provides that the franchise shall run for twenty-five years, but at the end of that time the city shall be empowered to grant a renewal on a revised basis of compensation. It is provided also that the company for the first term shall pay to the city 3 per cent of its gross receipts, and shall furnish free telephone service for municipal use.

The Independent Telephone Company of Emporia, Kansas, is preparing to fight the recently passed Kansas law which provides that fifty cents per month shall be the rental for all rural telephones where the farmers buy their own telephone. This company has been charging $1 and says that the law is unfair.

In the Financial Field

MARCH EARNINGS OF FEDERAL COMPANY.

THE earnings of the Cuyahoga and other subsidiary companies of the Federal Telephone Company for March are of an interesting nature. The statement of the Cuyahoga is the most interesting of the lot for the reason that it shows the largest increase in both gross and net. One year ago the company earned gross $33,000, while this year the earnings are $45,000. The company is operating at a high cost because of the fact that it is making liberal expenditures for maintenance and for the development of business. In spite of these facts the surplus earnings for March are seventy-five per cent greater than for the month one year ago. The statements are as follows:

THE CUYAHOGA.

	1905.	1904.
Gross earnings	$45,022.75	$33,328.96
Expenses and taxes	25,524.46	18,782,77
Net earnings	$19,498.29	$14,546.19
Deductions	11,835.67	10,266.42
Surplus	$7,662.62	$4,279.77

THE COLUMBIANA COUNTY.

	1905.	1904.
Gross earnings	$4,171.44	$3,800.98
Expenses and taxes	2,573.00	2,853.89
Net earnings	$1,598.44	$947.09
Deductions	973.93	907.82
Surplus	624.51	$39.27

THE CITIZENS,' FOSTORIA.

	1905.	1904.
Gross earnings	$1,123.66	$1.071.34
Expenses and taxes	695.79	631.57
Net earnings	$427.87	$439.77
Deductions	278.05	267.83
Surplus	$149.82	$171.94

THE FINDLAY HOME.

	1905.	1904.
Gross earnings	$1,840.03	$1,810.76
Expenses and taxes	1,143.02	1,083.42
Net earnings	$697.01	$727.34
Deductions	489.94	445.83
Surplus	$207.07	$281.51

THE LANCASTER.

	1905.	1904.
Gross earnings	$1,574.73	$1,406.53
Expenses and taxes	905.99	909.65
Net earnings	$668.74	$496.88
Deductions	221.84	222.34
Surplus	$446.90	$274.54

THE MASSILLON.

	1905.	1904.
Gross earnings	$1,714.72	$1,805.98
Expenses and taxes	1,207.81	1,205.93
Net earnings	$506.91	$600.05
Deductions	382.15	381.21
Surplus	$124.76	$218.84

THE STARK COUNTY.

	1905.	1904.
Gross earnings	$6,413.75	$5,585.88
Expenses and taxes	3,137.64	2,812.06
Net earnings	$3,276.11	$2,773.82
Deductions	1,628.90	1,602.06
Surplus	$1,647.21	$1,171.76

THE YOUNGSTOWN.

	1905.	1904.
Gross earnings	$4,508.25	$4,237.89
Expenses and taxes	2,033.81	1,958.14
Net earnings	$2,474.44	$2,279.75
Deductions	1,104.20	1,186.22
Surplus	$1,370.24	$1,093.53

THE ZANESVILLE.

	1905.	1904.
Gross earnings	$2,653.74	$2,462.32
Expenses and taxes	1,758.72	1,708.15
Net earnings	$895.02	$754.17
Deductions	632.00	632.21
Surplus	$261.02	$121.96

The statement of the United States Telephone Company is always one month later than the others and the following statement is for the month of February. The statement for March will be considerably improved.

	Feb., 1905.	Feb., 1904.
Gross earnings	$34,328.31	$32,181.07
Expenses and taxes	22,757.28	18,935.19
Net earnings	$11,571.03	$13,245.88
Deductions	9,110.10	8,372.42
Surplus	$2,460.93	$4,873.46

CORPORATION MORTGAGE FOR $15,000,000.

A corporation mortgage of $15,000,000 has been given by the Independent Telephone Securities Company of Utica, New York, to the Security Trust Company of Rochester. The telephone corporation includes the majority of Independent companies in New York. The mortgage is to secure a bond issue for $15,000,000, which will be used in the acquisition of other Independent telephone companies. The majority of the promoters of the new corporation are Rochester men, three of the five directors residing in that city. These are the directors of the company, each holding 100 shares of the $800,000 stock of the Independent Telephone Securities Company: Thomas W. Finucane, Frederick W. Zoller, George R. Fuller, Rochester; Charles H. Poole, T. Harvey Ferris, Utica. The new corporation is a "holding" company and controls the Independent systems in Otsego, Herkimer, Oneida, Lewis, Jefferson and Oswego counties.

MAKES A STRENUOUS DENIAL.

James S. Brailey, president of the Toledo (Ohio) Home Telephone Company, is indignant at the reports in circulation to the effect that the recent rise in the price of the company's stock is due to the fact that the Bell people are buying up the stock with a view of gaining control.

Said Mr. Brailey: "There is absolutely no foundation for the report. I have been called up over the telephone by a great many of our stockholders, who want to know about these rumors, and it is annoying. I wish to emphatically deny any and all rumors about the sale of the company. The truth of the matter is simply this: When I returned from Hot Springs, Arkansas, some days ago, I brought with me two men. The home of one is in Louisville and the other resides in Kansas City. Each of these men represents a group of capitalists in his respective city, who are looking for investments. I brought them to the directors of the Home and we held a meeting to discuss the purchase by them of some of our stock.

"The directors do not wish to see any stock held in

Toledo disposed of, and so an agreement was made that if we should assist these two men to acquire all the stock held on the outside they would make no effort to get any of the company's securities in Toledo. We helped them to buy the stock held in Wauseon and Elyria, which embraced, all told, about twelve per cent of the total, they paying $120,000 for it.

"Toledo people own about eighty-five per cent of the stock of the Home Telephone Company, and they will continue to own it. The people who did the buying are interested in the Kansas City and Louisville home plants, and purchased the stock as a permanent investment. I have not the least hesitancy in saying that the Bell people will never own a controlling interest in the Toledo company."

COMPANIES DECLARE DIVIDENDS.

The following Independent telephone companies at recent meetings declared dividends ranging from 4 to 12 per cent annually:

Clinton (Wis.) Telephone Company, annual, 10 per cent.

Shakopee (Minn.) Telephone Company, annual, 12 per cent.

Bloomer (Wis.) Telephone Company, annual, 12 per cent.

Roland (Iowa) Telephone Company, semi-annual, 5 per cent.

Fort Royal (Va.) Telephone Company, annual, 6 per cent.

Belvidere (Ill.) Telephone Company, quarterly, 2½ per cent.

Northern Telephone Company, Fonda, Iowa, annual, 8 per cent.

Friendship (N. Y.) Telephone Company, semi-annual, 4 per cent.

Mt. Vernon (Ohio) Home Telephone Company, annual, 6 per cent.

Ft. Wayne (Ind.) Home Telephone Company, semi-annual, 1½ per cent.

Rural Home Telephone Company, Owensboro, Kentucky, annual, 7 per cent.

Princeton (Indiana) Home Telephone Company, quarterly, 1½ per cent.

National Telephone Company, Fort Wayne, Indiana, quarterly, 1 per cent.

United States Telephone Company, Cleveland, Ohio, annual pfd., 6 per cent.

OFFER FIRST MORTGAGE BONDS.

Farnsworth, Bills & Company of Chicago are offering at par and interest, $108,000 of the Sioux Falls (S. D.) Citizens' Telephone Company's first mortgage gold 6s, issue limited to $200,000; outstanding, $153,000; dated December 1, 1902, due December 1, 1922; interest payable June 1 and December 1 at Royal Trust Company, Chicago, trustees, and Kountze Brothers, New York. Denominations, $100, $200, $500 and $1,000. A circular says: "Liberal perpetual franchise; no royalty; no free telephones to city. Incorporated under laws of South Dakota. Capital stock, $200,000. Approximately $200,000 invested; 1,450 telephones in use, and adding new ones at the rate of thirty-five per month."

COMPANY GIVES $500,000 MORTGAGE.

A mortgage has been filed in the county clerk's office at Rochester, New York, by the Independent Union Telephone Company for $500,000, given to the Knickerbocker Trust Company to secure bonds for the same amount. The purpose of the company is to acquire and operate telephone lines and exchanges in Erie, Niagara, Chautauqua and Orleans counties. The promoters in the Independent Union Telephone Company, in the Rochester Telephone Company and in the Independent Telephone Securities Company are in many cases the same and the expansion of the Independents gives promise that the Rochester company will ultimately be taken over.

SHOWS A BIG GAIN.

The statement of the Delaware & Madison Counties Telephone Company of Muncie, Indiana, for the month ending March 31, 1905, was as follows:

	1905.	1904.
Income from rents	$7,004.32	$5,799.38
Income from tolls	1,573.89	1,159.94
Building rent	133.80	135.00
Discount	25.00	
Allowances	20.75	43.95
Gross income	8,716.26	7,050.37
Operating charges, taxes, insurance	4,072.74	3,735.44
Net income	4,643.52	3,314.93
Interest	1,678.67	1,656.55
Surplus for stock	2,964.85	1,658.38

BRIEF FINANCIAL NOTES.

The Litchfield (Mich.) Telephone Company has increased its capital stock to $25,000.

Springfield-Xenia telephone 5s are now quoted around 72½ and are said to be due for an advance.

The Cedar Rapids and Marion (Iowa) Telephone Company has increased its capital stock to $200,000.

The Platte County (Neb.) Independent Telephone Company has increased its capital stock to $40,000.

The Joplin (Mo.) Home Telephone Company has increased its capital stock from $200,000 to $750,000.

The Johnstown (Pa.) Telephone Company has increased its capital stock from $200,000 to $400,000.

The Mt. Vernon (Ohio) Home Telephone Company has increased its capital stock from $150,000 to $200,000.

The Western Telephone Company of Big Spring, Texas, has increased its capital stock from $30,000 to $60,000.

The Union Telephone Company of Hope, North Dakota, has increased its capital stock from $50,000 to $100,000.

The Citizens' Telephone Company of Circleville, Ohio, has increased its capital stock from $64,000 to $200,000.

The Stark County Telephone Company of Toulon, Indiana, has increased its capital stock from $6,000 to $25,000.

The Sangamon County Telephone Company of Pawnee, Illinois, has increased its capital stock from $25,000 to $60,000.

The Bureau County Telephone Company of Princeton, Illinois, has increased its capital stock from $120,000 to $200,000.

The Farmers' Mutual Telephone Company of Whitley county, Indiana, has increased its capital stock from $25,000 to $100,000.

The net earnings of the Keystone Telephone Company of Philadelphia for the month of April were $36,500, the largest of any month since the company began business.

At the annual meeting of the Minnesota Central Telephone Company of Willmar, Minnesota, an increase in earnings of $17,813.68 for the past year was reported.

The Hastings (Neb.) Independent Telephone Company has increased its capital stock to $300,000 to provide for an issue of $150,000 of preferred stock, to draw 6 per cent dividends annually.

The Kansas City Home Telephone Company has just paid into the city treasury $2,054.17, the amount representing 2 per cent of the company's gross receipts for the months of January, February and March.

The Nuckalls County Telephone Company of Nelson, Nebraska, has increased its capital stock from $25,000 to

$50,000. The board of directors also has given authority to bond the company to the amount of $10,000.

The Kinloch Telephone Company has paid over to the city treasurer of Alton, Illinois, $110.11, being 1 per cent on its gross earnings in Alton for the year 1904, as called for under the ordinance granting the franchise.

The Boone County (Iowa) Telephone Company has voted to issue $50,000 bonds. Not all of the bonds will be used in improvements, as part will be required for retiring outstanding bonds that are about to expire, but some $25,000 will be spent in the city of Boone.

The Peninsular Telephone Company of Detroit, Michigan, has increased its capital stock from $25,000 to $100,000 to provide funds for building new lines from Detroit to Jackson, Detroit through Pontiac to Flint, and from Detroit to Port Huron, to connect with the Co-operative company in that city.

An authentic report from Port Jervis, New York, says that stock of the Orange County Telephone Company, which sold at 150 two months ago, has been purchased at 100 since the break with other Independent lines. The Orange County is the company that operated in Middletown, New York, and sold recently to the Hudson River Bell Company.

It is stated all of the Independent telephone companies of southeast Nebraska, northeast Kansas, southwest Iowa and northwest Missouri have been combined into one company. The promoters are preparing to float bonds to the amount of more than $500,000. The new company will control all the Independent lines between Lincoln, Omaha, Kansas City, and Red Oak.

Comptroller Gilbert of Buffalo, New York, has received from the Frontier Telephone Company of that city three per cent on its gross earnings for the year just passed. The check was for $5,605.26. The gross earnings of the company for the year 1904 were $186,841.79. The statement of the gross receipts and the three per cent payment is according to agreement under the franchise.

The Streator (Ill.) Independent Telephone and Telegraph Company has filed a trust deed for $125,000 to the American Trust and Savings Bank of Chicago to secure bonds issued by the company. This deed is said to have been filed in connection with the transfer of the stock of the Streator Independent Telephone Company to the Streator Independent Telephone and Telegraph Company, a new incorporation recently incorporated under the laws of New Jersey.

It is rumored, although not officially confirmed, says the Cleveland World, that within a very short time the Cuyahoga Telephone Company will pay 6 per cent of the accumulated dividends upon its preferred stock, now due, having more than sufficient surplus of earnings to enable it to do so. Furthermore, it is expected that on July 1, when another semi-annual payment will fall due, there will be sufficient additional accumulation of surplus to pay it in full.

The statement of the United States Telephone Company for the month of March is the best that has been put out by that company with one exception. The complete statement is not yet made up, but advance figures show surplus earnings for the month of over $7,000, or at the rate of $84,000 a year, which is 6 per cent on the preferred and nearly 3 per cent on the common. Col. Dickson, president of the company, expects the earnings to show up fine from now on.

The Interstate Telephone Company of Little Falls, New York, has negotiated a loan of $125,000 from the Empire Trust Company of New York city. A first mortgage was given to cover a bond issue which will be made. The company, which is one of the strongest and most modern in the Empire state, will expend the money in improving its equipment and business facilities, in reconstructing and re-equipping portions of the system, and in extending its lines.

Chicago Telephone stock has been selling at 125 on the local market, a drop of 10 points from the last preceding quotation, about the middle of April. Previous to that time the price had stood for several weeks at 140. There has been stock for sale at 130 for some time, but there have been no bids in the market. The company's legal trouble with the city of Chicago concerning rates and the necessity for renewing the franchise soon have told against the price of shares.

A Cleveland dispatch says: At the conclusion of a meeting of the trustees who have had charge of the affairs of the Eeverett-Moore syndicate for two years or more, Chairman Dickson announced that the various traction and telephone properties controlled by the syndicate had been formally transferred back to the Everett-Moore people. "I may add," said Mr. Dickson, "that since the bankers' committee and trustees took hold of the affairs of the syndicate, the debts have been reduced from $17,000,000 to less than $2,000,000. The latter incumbrance is amply provided for and the properties are all in first-class shape."

The Kansas City Long-Distance Telephone Company, whose capital stock is now owned by the Kansas City Home Telephone Company, has given a mortgage to the Commonwealth Trust Company of St. Louis, trustee, to secure $600,000 of 5 per cent gold bonds, which are guaranteed both as to principal and interest by endorsement by the Kansas City Home Telephone Company. Of these bonds $600,000 are outstanding. This company was incorporated December, 1903, as the Western Independent Telephone Company, the name being changed to its present form in December, 1904. The authorized capital stock is $1,500,000. The mortgage covers all of the company's lines.

NEW INTERURBAN TELEPHONE COMPANY.

Special telephone connections between nearly all of the cities in northern Illinois and southern Wisconsin is promised by the formation of the Interurban Telephone Company of Rockford, Illinois, with a capital of $30,000. It is proposed to build connecting long-distance lines from Rockford to Belvidere and to Freeport, Illinois, and in time to Janesville, Wisconsin. There is a connection now with Belvidere by way of Caledonia, but this is not considered direct enough to give the best service. The new line will go by way of Cherry Valley. To the north it is proposed to connect with Beloit, Wisconsin, by way of Roscoe and Rockton, Illinois. There the new long-distance corporation will secure good business from the connecting of the line to the Badger State Telephone Company, which extends all over Wisconsin.

"A preliminary meeting will be held in about two weeks," said Secretary John Camlin of the Rockford Home Telephone Company. "We have been unexpectedly successful in raising the funds for the Interurban Telephone Company and in securing subscriptions, and it will not be long before the Home Telephone Company will have good working toll lines of its own through northern Illinois and into Wisconsin. There will be a line to Freeport, connecting there with the west line to Dubuque and to Iowa points on the Independent service. This line to Freeport will be built so as to add Winnebago, Pecatonia, Ridott and other towns."

To telephone from the bowels of the earth in any one of its fifty-four mines direct to the company's headquarters at Pottsville, Pennsylvania, is the feat the Reading railroad company expects to accomplish. The company is trying a new style of telephone in its inside workings to expedite and safeguard the business.

An Enthusiastic Annual Meeting

ENTHUSIASM and enjoyment marked the annual meeting of the stockholders of the Mt. Vernon (Ohio) Telephone Company, recently held at Mt. Vernon. There was a large attendance, and in addition to the business transacted there was a banquet, at which a number of addresses were given, making altogether an extremely profitable and pleasant occasion. Frank L. Beam, president of the company, presided at the meeting, at which were read the reports of H. C. Devin, secretary; P. S. Kelser, treasurer, and E. W. Breece, superintendent.

Secretary Devin's report showed $115,500 in stock distributed among 124 stockholders, practically all of whom are residents of Knox county, this indicating that the company is composed almost wholly of home people and showing that when subscribers refer to the system as that owned by the "Home" company the term is not misapplied. The report showed that the past year has been a busy one in the construction department. Five hundred and thirty-six subscribers have been added, making a total of 2,139 telephones now being operated by the company. The sum of $35,456.95 was expended during the year in building additions and extensions.

Superintendent Breece's report was devoted largely to a description of extensions and improvements. He made particular mention of the new plant in Danville, where the company owns its building and has its exchange located in handsome quarters, the best of any of the smaller exchanges in the county. This improvement cost $12,343.60 and the investment is considered a fine one, as the service in the eastern part of the county is handled largely through this exchange, which is being built up rapidly.

The report of Treasurer Kelser gave receipts and disbursements for the year and showed a balance in the treasury. The company has paid during the year just closed quarterly dividends aggregating 6 per cent per annum, and the earnings were very satisfactory.

By vote the stockholders authorized the board of directors to increase the capital stock from $150,000 to $200,000. The increase in the capital stock is to provide for further extensions and improvements, among which will be the erection of a handsome new building for the use of the Mt. Vernon exchange and offices.

Directors were re-elected, as follows: Frank L. Beam, W. P. Bogardus, Harry C. Devin, P. S. Kelser, B. D. Herron, E. O. Arnold and R. G. McClelland.

Later in the evening the directors met and elected the following officers:

President, Frank L. Beam; vice-president, W. P. Bogardus; secretary, Harry C. Devin; treasurer P. S. Kelser.

Following the business meeting the stockholders, together with a few friends, the young ladies from the exchange and other employes of the company, sat down to an elaborate banquet. The tables were neatly arranged and were decorated with numerous beautiful bouquets of carnations. Smilax and fern leaves were also used in the table decorations. Each guest was presented with a carnation, a souvenir pin tray and an artistic programme. To each programme was attached a tiny receiver, tied with a bow of red ribbon.

At the conclusion of the banquet F. L. Beam, who, in addition to being president of the Mt. Vernon Telephone Company, is manager of the Citizens' company in Columbus, and president of the Ohio Independent Telephone Association, called the guests to order. As toastmaster he made a brief and pleasing address, after which the following programme of toasts was given:

"The Duty of Stockholders" was effectively handled by W. P. Bogardus.

"The Ladies Can Help" was the topic assigned to Mrs. W. F. Semple, who spoke as follows:

Early in the world's history the fact that it was not good for man to be alone was in evidence, and woman was created as a helpmate for him. The first service she rendered worthy of note seems to have been a large lesson in knowledge, which, unsolicited, she gave him, after having partaken thereof herself. In this she undoubtedly meant well, but was misguided. Ever since, woman has been relegated to a back seat in the Chariot of Progress, and if she be wise, she never taps her knowledge-box unasked to further the interests of her fellow-man.

I have been invited to speak on the subject, "The Ladies Can Help." This I recognize not only as an honor, but an opportunity to exploit woman's many virtues and her diversity of talents. I have reason to believe, however, that the programme committee expects me to draw the line, including only those who are stockholders in the Mt. Vernon Telephone Company. But there again I am hampered by further limitations. I have no doubt it would be a great pleasure to our fellow-stockholders to know what charming women we are, singly and collectively, as viewed from our own standpoint, but "Business before pleasure" is a maxim well to follow, and the pleasure here referred to I feel sure can be indefinitely postponed without causing great disappointment to anybody.

"In days of old when knights were bold," in England, "lady" was adopted as an alias for woman, to designate the classes from the masses, but, Americanized, it loses its significance as a lady of quality and merely represents quantity. "Salesladies," "washladies," "scrubladies," and so on, now advertise for situations. Then there are the ladies who toil not, neither do they spin. Among them all, however, there is a large proportion who fulfill the purpose of woman's creation, to be the helpmate of man; and the subject assigned me indicates that the lady stockholders of the Mt. Vernon Telephone Company have passed the civil service examination for this class.

The promoters of a trust in "a land that is fairer than this" have said, "Where thy treasure is, there will thy heart be also." While we all put our faith in this trust, experience and observation have taught us that the Lord helps those who help themselves, and in doing this we find life a struggle, to live comfortably and at the same time lay up a competence for the emergencies of sickness and the inevitable infirmities of old age.

How best to invest a few hundred or thousand dollars, as the case may be, money honestly earned and saved at the cost of rigid economy and self-denial, causes the possessor thereof as much anxiety as John D. Rockefeller must feel in his attempt to lay up treasures in heaven by gilding missionary societies, churches and schools with his ill-gotten gold. People who have money to invest do not find it smooth sailing by any manner of means. There is the annual trip they must make through the narrow channel between Scylla and Charybdis, the assessor on one hand and conscience on the other.

With men (present company of course excepted) conscience is a latent principle, which only becomes active when used as a proxy in exposing the sins of the other fellow. By "ways that are dark and tricks that are vain" man trims his sails and glides through the narrows safely, not even the searchlight of the tax inquisitor being able to discover and capture a large share of the unlisted securities, goods and chattels in which his money is invested, a per cent of which was honestly due Uncle Sam, the state and municipal government.

But the conscience of woman is active, in fact, in most cases of volcanic nature, and when the "weaker vessels" have to pass through these same straits there is sure to be a wreck from the explosion of a submarine mine which conscience has placed there, and the assessor captures the salvage, which includes all her earthly possessions; even the mental reservation upon which she had counted to save something, goes down with the wreck, and for the balance of the year she meditates whether after all honesty *is* the best policy, and, if so, why so few people practice it.

In the Mt. Vernon Telephone Company an exceptionally fine opportunity is offered for investment. It has outlived the experimental stage, is vigorous and growing rapidly. It pays a six per cent dividend quarterly and has an accumulating surplus. Its stock is exempt from taxation and is really equivalent to a first mortgage investment at nine and one-half per cent interest; and it insures withal an easy conscience to its stockholders. It is also a public

benefaction. The telephone is a great time saver; while it may not actually prolong life, by means of it man, in his allotted length of days, can accomplish more than he could in a century of mental and bodily vigor without it. In business it is indispensable.

As to its merit as a social factor, I shall not attempt to go into detail, but refer you not only to the "lady of the house" but to the "cook lady," her friends and admirers. My experience, hearing one side of frequent conversations, leads me at times to pronounce it a "howling success."

The telephone is a means of grace. Its benefits thus considered can hardly be estimated; they come alike to saint and sinner. A number of churches are already equipped with telephones and immense receivers are so placed that invalid members can have the ministrations of the church, hear the sermon and the music, while they recline comfortably in easy chairs in their own homes, about the only thing they miss being the passing of the alms basin, and possibly a few pointers on prevailing fashions.

The patrons of the telephone, it must be admitted, besides having troubles of their own, are at times greatly inconvenienced by unavoidable troubles in the telephone service. Sometimes the telephone gets out of order and sometimes the girl who operates it is out of order—conditions which give fine opportunity to patrons to cultivate the Christian graces—patience and forbearance.

While the stockholders of the telephone company have reason to be gratified and more than satisfied with the success already achieved, the increasing business demands a like increase of capital. This question is to be voted on at this meeting. The ladies can vote, and I am sure need no coaching, as they are always up to date. If we stand still we are retrograding, because the progressive world moves on and leaves us monuments of inertia—memorials of lost opportunity.

Voting to increase the capital stock, however, does not deposit the money in bank to the credit of the telephone company. The stock must first be sold. To those of us who appreciate its value as an investment it would seem that the stock should all be taken by subscription before it is issued. Possibly the ladies can help in placing this stock, by taking more themselves and recommending it to their friends. I am sure they can and will promise moral support and will heartily endorse any means the president and directors may decide upon to keep the equipment of the Mt. Vernon Telephone Company first class in every particular.

Harry C. Devin replied to the toast, "The Mt. Vernon Telephone Company."

Hon. L. B. Houck spoke on "Some Observations."

Rev. R. G. McClelland of Fredericksburg discoursed on "Farm Telephones."

Each of the toasts was interesting and contained many good paints, showing the strength of the Mt. Vernon company and the Independent movement and urging the stockholders to stand together in the work of building up the already excellent system.

ARCOPHONE PRODUCES VAPOR MUSIC.

Perhaps no entertainment given in Milwaukee recently has so excited curiosity as that furnished by the Wisconsin Telephone Company at the Press club smoker, says the Milwaukee Sentinel, in which an ordinary electric arc light was made to serve as a transmitter of sound exactly as the receiver of a telephone instrument. While the fact that this was possible has been known to telephone and electrical experts for some time, the effect was produced with no little labor and experiment and time by the employes of the engineer's department of the telephone company, and Chief Engineer C. W. Burkett explains how it was done.

"This effect was produced by connecting a telephone receiver around an impedance in the regular electric light circuit," says Mr. Burkett. "This may sound technical, but I will try to explain it in as simple a manner as possible, so that it will be easily understood. The transmitter was at our main office at 424 Broadway, and the arc lamp was supplied with the regular commercial electric current. The reason the transmitter was located two blocks from the lamp was to demonstrate our ability to transmit sound successfully. It could probably have been done 200 miles away as readily. To produce the music in the arc we attached a large graphophone horn near the transmitter in our office to concentrate the sound waves. In speaking into the transmitter the sound waves strike the diaphragm of this transmitter and this causes the current to pulsate, which in turn sets up pulsations in the arc circuit. The ordinary arc light is composed primarily of carbon vapor and it is well known that carbon vapor is unstable and responds in volume to the slightest variations in the amount of the current. The vibrations of the volume of vapor which causes the light moves the air about it so fast that it is impossible for the human eye to see. Hence the volume of vapor increasing and diminishing sets up the sound waves in the surrounding air. This produces almost the same effect as the ordinary receiver of the telephone placed to the ear. The pulsations of the vapor reproduce the sound."

Mr. Burkett had never seen the arcophone worked before, but was familiar with it as an expert. He stated that the same effect could be produced simultaneously with twenty street arc lights attached to one circuit. The company was obliged to send to Chicago and other places for the necessary special materials, but the success attending the experiment justified all their efforts.

The Star theater quartette selection, which also greatly interested the Press club visitors, was produced by members of the Arlington quartette singing into separate telephone instruments bridged together, and the sound was intensified by means of a megaphone at the Press club.

Numerous weird effects were produced by the graphophones which were used, but perhaps that which aroused the most curiosity was A. E. Thomas' invention, for which he has applied for a patent, which he calls a "dolcer." By means of it he is enabled to control the volume of sound of a graphaphone, producing the same effect as the loud and soft pedals of a piano. It is a simple device and can be readily attached to any talking machine. It can be arranged so that the same key will be maintained by the instrument, or the operator can raise and lower the sound at will. Mr. Thomas, who is the Milwaukee manager of the Columbia Phonograph Company, believes that in a short time the "dolcer" will be in general use on all talking machines, or on those whose owners obtain the right to use the patent.

PROGRESSIVE COUNTRY EXCHANGE.

The Litchfield (Mich.) Telephone Company, which has been uniformly successful since it was organized, has outgrown the sanguine hopes of its promoters, and they have grown the sanguine hopes of its promoters, and they have to $25,000. Par value of shares has been changed from $100 each to $10 each, making it possible for local people to more easily become stockholders, and the company will offer a small amount of the treasury stock for sale, for the purpose of extending the system.

The company now has 240 telephones installed, with orders for more coming in almost daily, and at the last meeting of the directors a 3 per cent semi-annual dividend was declared. The company has not only outgrown its capital stock, but it has also outgrown its name. From a local exchange, designed to connect the farmers and business men of the township, it is growing and reaching out until some less localized name seemed more fitting for it.

It is an institution of which the village is justly proud; conducted as it has been by the leading business men and farmers, it has been a credit, both in construction and management, both of which have drawn the attention of outside telephone people to the Litchfield exchange.

How many housekeepers have the telephone mouthpiece cleaned every day? It is idle to ask how many business men demand such cleanliness because it is tolerably certain that none do. Yet both the receiver and the mouthpiece should be thoroughly cleansed with a damp cloth every morning to avoid the collection of dangerous germs. Everyone who has revolted before the disgusting atmosphere of a public telephone booth must realize the truth of this statement.

Telephony.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

TRUTHFUL ❧ FEARLESS ❧ INDEPENDENT

Edited by
H. B. McMEAL and H. E. BABCOCK

Published by
The TELEPHONY PUBLISHING CO.
301-336 MANHATTAN BUILDING, CHICAGO, ILL.
Telephone: Harrison 2951

H. B. McMEAL - - - - - - - - - - - President
ED. J. MOCK - - - - - - - - - Secretary and Treasurer

European Office: 36 Maiden Lane, Covent Garden, London, W. C.

TERMS OF SUBSCRIPTION:

United States, Canada or Mexico - - - - - Per Year, $1.00
Foreign Countries, within the Postal Union - " " 2.50
Single Copy - - - - - - - - - - - - - 10 Cents

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Change in advertisements intended for a particular issue should reach the Chicago office of TELEPHONY by the 20th of the month preceding publication. New advertisements can be received up to the 25th of the month.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND CLASS MAIL MATTER

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CHICAGO, JUNE, 1905.

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THE NATIONAL INTERSTATE INDEPENDENT TELEPHONE CONVENTION.

ALL roads lead to Chicago on June 20, 21 and 22, the dates of the convention of the National-Interstate Independent Association in that city. Independent telephone men are coming from all sections of the country and it is confidently predicted that the attendance will go above the thousand mark. Some twenty states will be represented by duly elected delegates, no less than 250 already having been chosen.

Never in the history of Independent telephony has there been such a degree of enthusiasm and harmony manifested over an approaching convention as in this instance. The Independents from Maine to California are standing shoulder to shoulder, giving an overwhelming impetus to the great movement, and the manifold triumphs of the present hour presage still greater things for the future. The watchword of the hour is organization, and the organization spirit will dominate the proceedings of the coming convention.

In the matter of interest and entertainment the convention will come up to the fullest measure of expectation on the part of all those who attend. A full programme of papers, etc., is being prepared. A list of those features already arranged for will be found in another part of TELEPHONY. The entertainment committee is not idle and will leave nothing undone to give the delegates a highly enjoyable time. An elaborate banquet at the Auditorium Hotel—the convention headquarters—will be one of the things to look forward to.

The manufacturers and supply men have reserved one entire floor of the hotel for display purposes and their exhibits will be in keeping with the importance of the occasion.

TELEPHONY, as usual, will have headquarters at the convention, and those in attendance will find the latch-string out and the glad hand awaiting them at Room 646.

This will be a convention worth attending—the greatest in the history of Independent telephony—and every man engaged in the work, who can possibly do so, should lay his plans to attend. It will be well worth the time, expense and effort.

"WHEN THEY BECOME A BUSINESS PROPOSITION."

IT is not surprising, in a cause like the great Independent telephone movement, wherein thousands of men, drawn from the manifold walks of life, and whose force of character runs the scale of moral strength, that occasionally someone should falter at the sound of clinking gold, dinned into his ears by the crafty enemy, forget his vows of fealty to present interests and the sacred trust that has been placed in him by the people and fall by the wayside—another victim to the curse of cupidity and the demoralizing lure of Bell "emoluments."

There was a time, in the early history of the movement, when the backsliding of an Independent—particularly if the man to surrender to the opposition wielded an influence in the ranks within which he fought—caused more or less perturbation among his former telephone associates, but as the movement grew apace and beyond all expectations

these scattering desertions no longer caused dismay and discouragement. On the contrary the field of the Independents has attained such gigantic proportions and their power has become so great that to-day when an Independent worker—captain in the ranks though he may be—succumbs to Bell influence, only pity is felt, because of "another good man gone wrong," as history has time and again shown that financial gain will not compensate for the loss of friends and their respect; the prickings of conscience, and the knowledge that one's former business associates have lost confidence in him.

No man in recent years has stood higher in the ranks of the Independents than Hon. Hugh Dougherty, president of the United Telephone Company of Bluffton, Indiana, for on many occasions, in the field and on the floors of conventions, he had evidenced his loyalty to the Independent cause. So well was he thought of by his fellow-workers that in 1903 he was unanimously chosen president, at the convention in Chicago, of the Independent Telephone Association of the United States of America—the highest honor that can be conferred on any Independent. Consequently he was one of the last men in the world of whom it would be thought that he would ever violate his allegiance to the cause. He has been for years a leader in the cause, and time and again, in scornful and unmeasured terms, has he denounced as traitors those Independents, here and there, who had sold out to the Bell. He has on repeated occasions sanctioned the sentiment that any man who would individually turn traitor to the Independent cause would as quickly betray the entire movement if he had the opportunity—and could get his price. Therefore, the confidence reposed in Hugh Dougherty by his fellow-workers was not without sufficient justification.

How mistaken were these estimates of Mr. Dougherty's loyalty to the Independent cause may be known when it is learned that the United Telephone Company has just passed into the control of the Central Union (Bell) Telephone Company. The worst part of this is not that the Bell has gained control of the United (which at its most can mean only a temporary setback for the Independents in the small territory in which the United operates), but that it marks the passing of Mr. Dougherty from the ranks of the Independents, and under the most regrettable and inglorious circumstances. And what may be said in this respect of Mr. Dougherty holds equally true of the other officers of the United company, for there is no reason other than to believe that they, one and all, likewise sanctioned the sale of the United to the Bell, and thereby forfeited all claims to further respect from the Independents or to continued favors at their hands. These officers are: James W. Sale, manager; L. C. Davenport, treasurer; C. H. Plessinger, secretary; James W. Sale, John W. Sale, L. C. Davenport, H. F. Hill, A. G. Lupton, W. B. Cooley, directors.

Only a few months ago, at St. Louis, on the occasion of the annual convention of the National association in that city, Mr. Dougherty (then president of that body) delivered an address, which now, in the face of the sell-out of the United to the Bell, has a peculiar and fascinating interest, and for the benefit of its readers—and incidentally Mr. Dougherty—TELEPHONY herewith makes a few excerpts from the aforementioned address, which go to show how wide apart were the sentiments then of the man who uttered the remarks with what they must be now that he has done what he cautioned others not to do. It seems difficult, in view of the present facts in the case, to believe that Hugh Dougherty, addressing a large body of representative Independent telephone men, ever gave utterance to the following:

> We hope that we will not lack in fealty to one another and to the interests we represent; so as we take up the sacred burdens laid upon us by the people *who have placed their trust in our care,* we should *reverently and joyfully bear them on to triumph* and unitedly bring about results that would benefit all the people, including the manufacturer, operator and patron.

Evidently Mr. Dougherty has forgotten his talk about "fealty to one another" and "the people who have placed their trust in our care." It also must be that since last summer he has had a revulsion of feeling in regard to "reverently and joyfully bearing these sacred burdens on to triumph." Are we to believe that Mr. Dougherty is a demagogue and a hypocrite, and that the almighty dollar is more to him than principle? There seems to be only one answer to this question. Again he said:

> *So each owes a duty to the other, and selfishness should not be the dominating spirit in our deliberations, or, after them, into the practical operation of our business.* To emphasize this thought I repeat what was aptly said by another: "The farmer who shears the fleece and cares not for the sheep has no reason to complain that the flock does not thrive."

Another case, apparently, of neglected duty—of a man failing to practice what he preaches—whose words, when it comes down to the actual carrying out of their sentiments, are as "sounding brass and tinkling cymbals." If the sacrifice of a principle for financial gain is not *selfishness* in the fullest measure, then what is? Nothing else but *selfishness* was the dominating spirit in the transaction that gave the United over to the Bell, and stabbed it to death in the house of its friends—its alleged friends. Mr. Dougherty without doubt now more fully realizes the import of "what was aptly said by another" in regard to him who "shears the fleece and cares not for the sheep." Another of Mr. Dougherty's statements was:

> Many have been the victories of the Independent telephone users since the first convention eight years ago. My heart is filled with joy over these successes in the expansion of the business, in our litigations with the Bell Telephone Company.

Can you, by any stretch of imagination, dear reader, conform the above words to the actions of an Independent operator who has just sold out to the Bell? We would like to ask Mr. Dougherty if his heart is still "filled with joy" over Independent successes—in which he will no more be a figure. Still further on in his address, Mr. Dougherty said—and his words have almost a prophetic ring as bearing upon his own case:

> After years of experience the Independent telephone people of this country, like all other benefactors, *will lose their hold on the minds and affections of the people when they become a mere business proposition,* and must meet the public expecting to be treated the same as all other competitors for business. However, there should continue to be a fealty between Independent operators that should hold them together and cause each to have the sympathy and aid of the other. This does not, however, always prevail even at this early stage.

Mr. Dougherty and his associates stand to-day as living examples of Independent operators who have "lost their hold on the minds and affections of the people," because they have "become a mere business proposition." Whatever element of the Independent situation they were they sacrificed for a cash consideration, and with that action went every vestige of claim to a "hold on the minds and affections of the people." It is the penalty that invariably is visited upon the man who betrays a trust.

S. P. Sheerin, president of the Indianapolis and New Long-Distance Telephone Companies of Indianapolis, and one of the noblest Romans in the Independent field, said of the sale of the United to the Central Union:

> I confess that I was astonished when I heard of the transaction. The first statement was that the Bell lines had been admitted to the exchanges in the United Telephone Company's territory. I called up Mr. Dougherty, the president of the United company, and from him I learned that the property had been sold. This will simply mean that the Independent people will put new plants in these cities, just as they have done, heretofore, in Logansport, Muncie, South Bend, Frankfort, Noblesville, and Elwood, which, up to this recent purchase, were the only points in the state where the Bell company had bought out the Independents. I do not regard the situation as

alarming in general to the Independent property in the state. In all these towns that I have named the new Independent plants have, on an average, quadrupled the business of the old plants, and in these towns covered by the United company history will simply repeat itself. The people will not submit to the monopoly, nor will they tamely submit to being sold out by their own people, who have been enjoying special privileges because they were their own people.

The establishing of Independent service in the counties where the United company formerly operated will probably begin at once. Heretofore when a crisis in the ever-present struggle for telephone business has arisen, developments have come rapidly, and such will probably be the case this time. We were greatly surprised by the sale, but it is not such a serious blow but that we will get over it. There are 170,000 Independent telephones in Indiana. The 5,000 which have been deflected are a very small part of the total. We will have connections in that territory and that very shortly. The Independents will have to secure franchises from the various cities, but this can be done without much inconvenience. The impression to the effect that Mr. Dougherty is a stockholder in the Indianapolis Telephone Company is erroneous, as he some time ago disposed of all his holdings in the concern.

The Indianapolis News had the following regarding the transaction:

A deal has been closed whereby the Central Union Telephone Company has obtained control of the United Telephone Company, a large Independent organization which held a practical monopoly of the telephone business in Wells, Grant, Blackford and Huntington counties. The Central Union thereby enters a field that has been held reserved for the Independent companies, bringing the fight between the Independents and the old company to a crisis in Indiana, as the Independent managers assert that they will immediately lay plans to enter the field occupied by the United Telephone Company, and put competitive plants in the cities now occupied by the Central Union through it.

The United Telephone Company operates about 5,000 telephones in Marion. Hartford City, Huntington, Bluffton, Montpelier and Upland, and has toll-line connections with a great many rural companies in the four counties in which those cities are situated. It has always been operated strictly as an Independent company. So greatly has the action of its managers in disposing of the plant been resented by other Independent managers that the allegation is made that the Independents "have been sold out by their own people." Hugh Dougherty, formerly of Bluffton, but now of Indianapolis, was president of the United Telephone Company.

The Central Union Telephone Company has not had local exchanges in any of the cities served by the United company, except in Marion. With the control of the United company now in its hands, the Central Union will hold an absolute monopoly of the telephone situation in the counties of Grant, Wells, Blackford and Huntington. At Marion the two exchanges will be consolidated, so that customers of both the companies may be served by the Central Union exchange.

According to a dispatch from Ft. Wayne, the center of the Independent telephone movement in Indiana, the action of the United company in disposing of its property to the Central Union has aroused indignation. George W. Beers, the pioneer builder of Independent telephone plants in Ft. Wayne, and who also built plants in Muncie, Anderson, Elwood and other gas belt towns, said of the transaction:

"The United Telephone Company has been very prosperous and has ranked as one of the best of the Independent lines. It was no doubt bought by the Bell interests for the purpose of wrecking it and holding it up as a horrible example of an Independent telephone failure. The Central Union has undoubtedly paid a price that was so much of a temptation that even an Indianapolis banker could not resist throwing down his friends." This thrust was made at Mr. Dougherty, who was closely associated with the Independent telephone movement in Indiana, and was at one time president of the Independents' association.

Three years ago, when the business of the United company began and it was earning large dividends, Hugh Dougherty, John W. Sale of Ft. Wayne, and J. B. Sale and L. C. Davenport of Bluffton, who held the majority of the stock, decided to bond the plant, which then controlled the exchanges at Bluffton, Huntington and Marion.

Mr. Beers has gone to Muncie, where he said that he would meet with representatives of other Independent lines and arrange to enter the territory formerly occupied by the United company.

Another phase of the situation is brought in the following from the Indianapolis Star:

Because of the action of Hugh Dougherty, president of the United Telephone Company, in allowing his company to pass into the control of the Central Union Telephone Company, S. P. Sheerin, president of the Indianapolis Telephone Company, has resigned as a director of the Marion Trust Company, an institution of which Dougherty is president. In commenting on his resignation Mr. Sheerin said: "We feel that brotherly love and a consideration of mutual interests is not out of place even in the business world."

The officials of the United Telephone Company defend their action in selling out to the Bell, and thus betraying their trust, by saying that it was their wish to give their customers the added service to be secured by connecting with the Central Union.

"A poor excuse is better than none."

TELEPHONIC WRONG NOTIONS.

THE second generation of users of telephone service does not bear the mark of being more thoroughly in touch with the fundamental truths of the art than was the first. It was the conception of the first generation that a telephone system consisted of the undeniable and material presence of a machine screwed to the wall, a little noisy scratching and scraping, a more or less pleasing distant voice, and much trial and vexation of spirit.

To conceive that these things can represent an investment of many hard dollars, really warranting the collection of a substantial annual fee from the patrons, has seemed to that generation to demand a cultivation of imagination not justified by the prosy character of ordinary existence.

A very limited self-analysis will convince any of us of the immense difference between personal observation and any other form of instruction. The telephonic public has been allowed by the very nature of things to remain out of the presence of all but the little group of things at his end of the line. What he sees he knows; what he only hears about will not arouse much enthusiasm. The daily life of the ordinary city impresses its inhabitant most forcibly with the existence of all forms of public utility of far less gross cost per user than a telephone system. The citizen must run for his car, and stand when he has caught it; in dodging another he is run over by an automobile; a dangling power wire kills his daughter's driving horse, and his country customer is continually reminding him of the cave-in of the La Salle street traction tunnel. These things are vivid and part of his daily life, within his understanding, and are constantly in evidence.

As by its very nature the best telephone system is out of sight, it must, perforce, be out of mind to many. It is the duty of the management of any such interest to keep its existence prominently before the people; naturally and simply, if possible; artificially, if not. In the smaller communities this is easier but less important, because small matters are subjects of common gossip there, and secrecy is impossible.

One of the many reasons for the large ratio of relative success in favor of the Independent system in competition throughout the country has been the publicity which the very nature of the struggle has given to the new enterprise. In every case this has died away in time. If you are anxious to secure the priceless advantages of such advertising you must start some new wonder in its place.

BELL COMPANY ROUTED IN IOWA.

THE American Bell Telephone Company, for twenty years the most haughty and uncompromising monopoly in America, has been forced by the farmers of Iowa to an unconditional surrender. After a warfare that has been in progress for two decades, and in which investment of many millions have been made, and both sides have suffered losses probably aggregating millions, the Bell company has been beaten and forced to acknowledge the fact.

The same warfare has been in progress all over the country, but nowhere else has it been fought so determinedly. The character of this hand-to-hand struggle may be imagined from the fact that it has developed in Iowa the most remarkable telephone business possessed by any state in the union. One-third of all the farmers' telephones in

the country, and one-fourth of all the mileage of wire connecting them, are credited by a recent census bulletin, to Iowa. It is the direct result of the telephone fight.

In the beginning the Bell company claimed that no other instrument could be used without infringements on its patents. After a time adventurous manufacturers began putting out instruments that they insisted did not infringe; they guaranteed to protect users of them; and the readiest market was found for them in Iowa. The Bell company started a great infringement action, but nothing ever came of it.

At that time there were already thousands of miles of Independent lines and scores of Independent exchanges in Iowa. They all used other than Bell apparatus. It was declared by the Bell that every Independent would be compelled forthwith to choose between paying royalties for past infringements and contracting to pay them in future or going out of business. The two meant about the same thing to most of the Independent telephone people, for they had not been very profitable as investments up to that time. Then the Bell people, who claimed that the courts favored them, surprised everyone by doing nothing at all.

From that time the expansion of the Independents was resumed. To-day there are almost 300,000 miles of rural and toll lines in Iowa, aside from the city and town systems. Almost all this business outside the cities and towns is controlled by the Independents, while in the cities there are almost always two exchanges—Bell and Independent.

The Bell exchange connects with the Bell system of toll lines; the Independent exchange connects with the Independent toll lines. The Bell people have always made it an ironclad rule that they will not connect their exchanges with Independent toll lines; and to offset this the Independents entered into an ironclad agreement not to permit any company using Bell instruments to exchange business or connect lines with them.

Thus in time it came to the point where almost everybody in Iowa owned stock in a telephone enterprise of some kind. The cities built their mutual exchanges, every user of an instrument being a stockholder; and in the country the farmers did the same. Town or country, the home without a telephone is far more rare in Iowa than the home which has two of them hanging side by side.

Almost all business houses are forced to have both systems, Bell and Independent. Gradually the Independents have won over the Bell. They have had a tremendous advantage in their hold on the country lines. These were neglected by the Bell people. They did not realize that in the end the rural line would be the key to the whole situation. But it has so proved. The rural line has become the most important part of the system, and the Independents had a practical monopoly of it. The rural lines connected with the Independent exchanges in cities and towns, and in order to connect with the country customers, people in the towns and in the cities used the Independent instruments. Nothing is so much like a huge snowball, growing by what it feeds upon as it rolls along, as is a telephone system. Given the lead in a decisive way, the Independents grew as never before until now they are in the lead in nearly very state in the union.

THE TELEPHONE IN GOVERNMENT SERVICE.

IN a recent issue the New York Post printed a dispatch from the Washington correspondent referring to the multitude of things that Uncle Sam does for his people besides governing them. The telephone is widely employed by the government to help the people, the Agricultural Department being the greatest user of it for this purpose. Through the weather bureau it is now distributing forecasts and special storm warnings to practically everybody in the United States. Recently it has been perfecting arrangements with the telephone trunk lines by which the daily morning forecasts are made available for the use of thousands of persons who heretofore were compelled to depend on the bulletins posted at postoffices and in railway stations.

With the growth of the rural telephone it is expected that, eventually, almost every American farmer will receive the daily weather bulletin in his own home before noon of the day it is issued. In some localities in Indiana, Ohio, Illinois and Pennsylvania the system of distribution has already been perfected to the point where every subscriber of a telephone company receives the day's forecast as early as noon.

Postal officials are confident that the day is not far distant when the rural telephone will become an important factor in the delivery of "hurry-up" letters. Congress has thus far declined to recognize the telephone system as a part of the postal machinery; but, notwithstanding its refusal, the telephone is being brought into use daily in many rural communities by farmers who cannot even wait for the rural carrier. Senator Fairbanks planned to have congress authorize the use of the telephone in the delivery of special letters addressed to country districts. He proposed that a special stamp should be printed, sold for ten cents, and that when a postmaster received a letter bearing one of these stamps he should open it, reading its contents over the telephone to the farmer to whom the communication was addressed.

Some of the senators objected to this plan because they feared it might commit the government to a policy that would compel it to pay large annual rentals to telephone companies. But many men in the postal establishment say the new step is coming. Indeed, it is already here unofficially. By securing permission from the department a rural postmaster may now arrange with his patrons out in the country to open their letters and read the contents to them over the telephone, and farmers who have city interests that demand careful watching are making use of the permission. Congress may give its sanction to such duties at its next session.

TELEPHONES IN INDUSTRIAL ESTABLISHMENTS.

A FEW weeks ago, at a meeting of the Institution of Mechanical Engineers, some of the British engineers who visited American shops last summer said very nice things about the places they inspected, says the Engineering Record. It is gratifying to know that American systems of shop organization are so good as to deeply impress competent critics from abroad. We have thought they were pretty good ourselves, but it is nice to be told so by men traditionally fault finding. It is idle to deny that there are some defects in the average organization, however, such as a general lack of means of quick communication between the minor parts of a plant. This is particularly strange in view of the extensive use of telephones in American commercial houses and private homes.

In the average industrial establishment there is a telephone connecting the superintendent's room with the main office, and that is all. If the superintendent wishes to talk with any foreman he must send a messenger for him or personally go after him. One or both men lose a quarter of an hour at least over a matter that could be settled over a telephone in a couple of minutes. If the foreman of one department desires to talk over something with another foreman he has to hunt him up, thus losing time needlessly. The aim of shop managers is to keep the foremen constantly in their departments, but if they have to go about the works hunting for other men every time they require information not in their possession, the system is weakened. The employment of messenger boys to secure tools and supplies for machinists, which is a feature of some shops, is in no sense a

substitute of the telephone for the foreman, although many shop owners seem to think that it is.

As a matter of fact, the push-button-and-messenger system of communication between the different parts of an office has a strong demoralizing effect in addition to being expensive and incomplete. A battery of push buttons is generally accompanied by a bundle of rubber stamps, a number of partly idle, cheap assistants to answer the calls, and the other indications of inefficiency. Where messengers are employed instead of telephones, there is a tendency to accumulate too many boys, and any young fellow who is sufficiently dry behind the ears to be advanced to a desk position immediately acquires the belief that his work is to be done by these slaves of the push-button. Pay rolls are padded unnecessarily by low-price help; expensive assistants are never engaged until their necessity is manifest, but a few more boys about an establishment attract little attention. The presence of these idle boys is not a great expense, although it is greater than the cost of a telephone system, but their effect on the staff a little higher up on the salary list is decidedly bad.

The tendency of the times is to make machinery do the work of persons, and the utility of the telephone in eliminating cheap labor in this way is overlooked to a surprising degree, even in works where skilled labor has been reduced to a minimum by the introduction of labor-saving equipment.

PROBLEMS.

THERE are two kinds of problems remaining unsolved in the telephone business. Those of one class will certainly always be accomplished, because they are the homely burdens of management, maintenance, construction, and other execution. These arise moment to moment, and are insistent for attention. Natural laws in infallible action will find men, good enough and plenty enough, to do these things.

The other class of problems is one in whose future lie the undiscovered things. Their accomplishment may not be hastened by higher pressure, nor may their results be had to order. They will not come about because a greater complexity of industrial conditions raises the possible price the public pays for such performance, nor because inventors shall gird themselves and say, "Now will I produce this long-sought thing."

The inventions, the discoveries—and the inventions based on discovery—which shall re-shape the gentle art of communication, are to come from men in whom exists an interest so vivid and a restlessness so great that they are relatively useless for the performance of the plodding, necessary, homely tasks of life. It is from these, by their effort in darkness and in silence, that we shall have the results which will upset present investments, magnify present magnitudes, and establish new codes of operation.

GOVERNMENT TELEPHONES IN CANADA.

THE Canadian parliament is investigating the affairs of telephone companies in the Dominion and is said to be paving the way for state ownership and operation of long-distance telephone lines. It is proposed to expropriate the Bell company's trunk lines and to build such additional lines as will give long-distance service at minimum rates from the Atlantic to the Pacific. The government's plan to popularize long-distance telephone service includes sweeping reductions in the scale of tolls.

Like in the United States there is an Independent telephone service in Canada in private hands, which competes with the Bell monopoly. But these Independent operators complain to parliament that the success of their business is minimized because their subscribers cannot get long-distance connections. The latter are for the most part controlled by the Bell company.

A parliamentary inquiry into these conditions has given birth to sweeping plans for government control of the long-distance lines. Municipalities will still manage their own telephone exchanges and the government disclaims any desire to interfere with them.

How far the entering wedge of government ownership will penetrate if the long-distance lines are successfully brought under public control, is pure speculation. But it is significant that public sentiment in Canada overwhelmingly indorses the initial step.

Canada but tardily follows the experience of many European states in government control of telephones. In Sweden, where telephone service is better and cheaper than anywhere else, the long-distance telephones are almost supplanting mail and telegraph service.

The Canadian experiment will be narrowly watched, by reason of the enormous possibilities hinging on its success.

NOT CLEAR AS A BELL.

THERE is a little bulletin sheet gotten out in the name of the League of American Municipalities, which seems to think that every telephone company started in opposition to the Bell company, giving low rates to the people, is foredoomed to failure and is bound in the long or short run to cost the innocent stock subscribers a goodly sum of money.

As the bulletin sets forth the case, these Independent telephone companies are usually started by the manufacturers of some other telephone patents and are gotten up for the sole purpose of selling the rival wares.

The bulletin claims that the people of the town in which the Independent company is started are usually secured as subscribers for stock; that the telephone company charges rates that are too low to allow of operation at a profit, and that eventually most of these companies smash up, but that in the meantime the telephone manufacturer has sold his wares and gone on to some other town. That is a most astonishing statement for the bulletin to make in view of the well-known facts in the case and the thousands of Independent companies now in operation. It is a statement that does not ring true as a bell, even though it does indirectly "boost" the Bell "game" along.

In every state in the Union the people of various towns, big and little, have felt the benefits of rivalry for the Bell monopoly. In some of these places fine buildings have been put up and the price of telephone service has been cut down by the Independent company. The rivalry has had a further effect, too, because the old monopoly, frightened by rivalry, has given its customers better service and better rates. Not only that, but there are innumerable dependent companies, which, far from being failures, have gone right ahead, making money and paying big dividends on stock which is way above par.

The bulletin, representing all the municipalities and being generally accepted as nonpartisan, should make a thorough investigation before making such sweeping statements. As it stands now this bulletin sheet is an example of monumental ignorance, or else it is a creature of the Bell and wilfully misrepresents the situation.

Should the ratio of increased use of the telephone keep up the wires will soon be carrying more messages every day than are handled in the mails. In the last three years the number of subscribers has doubled over the total of the previous twenty-four years, and because of the extended use of the telephone the average cost of every class of messages has been reduced to 2.2 cents, but little more than that required by the average mail.

Digest of Telephone Patents

Conducted by Edward E. Clement

783,995—F. B. Cook. Test Plug for Protective Apparatus.

This patent, it is stated, was omitted by accident from the last digest. It relates to a test plug to be used in connection with the protective apparatus of telephone lines. In the figure herewith the usual supporting strip is shown in section with spring contacts on its opposite sides for metallic circuit line and switchboard connections. The usual carbon arrester is shown in the middle, and a pair of heat coils or sneak current arresters, *i-i*, on opposite sides. The plug has two legs on opposite sides of an insulating support, *w*, each leg carrying three contacts, y^2, *x*, and *v*. The whole plug is substantially like an inverted U, whose prongs straddle the lightning arrester and enter between the contact spring of the heat coils, the inner contacts *v* of the plug then engaging the opposite faces of the carbon blocks and their springs. The plug contacts are connected to a switch through which they can be put on to test instruments, and the entire construction, which is both neat and ingenious, is such as to enable the various parts of each circuit to be tested without disarranging the protective devices or disconnecting the lines. There are thirty-seven claims in the patent, which appear to be fairly comprehensive.

787,361—J. Erickson. Telephone Transmitter.

This is a transmitter of inverted solid-back type, the property of the Strowger Automatic Telephone Exchange. The back electrode is solidly fixed by its threaded stud, *7*, in a bushed opening in the metal cup, *4*, which supports the diaphragm. The front electrode, *11*, is a small carbon cup with its bottom secured to the diaphragm and its mouth enclosing the rear fixed electrode, the edges resting all around against a felt packing ring, *9*. The granular material is held in the cup, surrounding the carbon head of the fixed electrode, and the cup vibrates with the diaphragm.

787,386—E. H. Little. Support for Telephone Receivers.

This is a bracket for holding the receiver to the ear, and comprises an angle bar having one arm bolted to the switchboard or wall near the telephone transmitter, a vertically swinging arm being pivoted to the projecting end of the angle bar and having a cradle for the receiver jointed to its outer end. Thumb nuts serve to clamp the parts when adjusted, and the receiver may be moved vertically or laterally, and also swung around in a horizontal plane.

787,507—J. I. Gemmill. Automatic Annunciator Restorer.

This is a combined drop and jack of the self-restoring type. The drop shutter is pivoted in the usual way on the face of the device, and the magnet has a forwardly extending arm on its pivoted armature normally holding up the shutter. The jack lies parallel to the magnet and below it. Between the magnet and the face plate, and directly above the jack tube, is a short closed tube containing three balls. An opening in the bottom of the tube permits the middle ball to drop down part way into the jack tube, and through an opening in the face plate a pitman or restoring pin extends from in front of the balls to a point just behind the lower end of the armature. When the magnet is energized, the drop falls as usual. When the plug is inserted, it pushes up the middle ball, which spreads the other balls apart and forces out the pitman, which forces up the drop shutter to restore it. The movement may well be called a ball-bearing restoring device.

The patent belongs to the Gemmill Telephone and Manufacturing Company of Orville, Ohio.

787,583—C. T. Mason. Telephone Receiver.

In this receiver, which belongs to the Sumter Telephone Manufacturing Company of Sumter, South Carolina, the diaphragm is supported over the mouth of a metal cup, through the bottom of which the pole pieces extend, having a shoulder on the inside and a clamping block on the outside secured between the limbs of the permanent magnet and to the pole pieces. The cap of the receiver screws on the rim of the metal cup and has its rear edge corrugated to receive the similarly corrugated front end of the shell, which is slipped on over the magnet structure from the rear, being held in place by the small cap *G* screwed on the tail block or yoke piece of the magnets.

787,610—H. P. Clausen. Telephone Transmitter.

This invention of Mr. Clausen's is very familiar to well-posted telephone men, and exhibits a great deal of ingenuity and some points of excellent design. To say that it is commercial or to comment upon its efficiency is unnessary, as the instrument is at present widely used and is presumably speaking for itself.

The gist of the invention is in the provision of a resistance button which is self-contained, fixed as to its adjustment, proof against ordinary mishandling, and at once simple and economical to manufacture. The front and back electrodes are sealed up in a metal pill box. The front electrode is in direct contact with the front of the box, while the rear electrode and its stud are insulated from the box and the hollow stem, the stud passing through the stem and carrying terminal nuts for making connection. When the instrument is assembled, as shown in the first figure herewith, the front stud of the resistance button is screwed to the diaphragm, and the rear stem is held in the usual bridge, which, however, has a novel and meritorious feature in that it is split across in the direction of its length, and has transverse screws to draw the split sections together upon the stem of the button to hold the latter fixed after adjusting.

The first figure herewith is a section showing the parts assembled, and the second figure shows them dissembled. The cup *J* is formed in two similar halves *j* and *k*, of thin metal. The rear electrode *L* is insulated by the mica disk *s* and the sleeve *r*, while the front electrode *K* has its disk *n* secured in contact with the front half of the cup. The granular material is inclosed within an insulating ring *l*, and the two halves of the cup or button are clamped together all around their edges by a ring *l'* crimped in place.

The patent is the property of the American Electric Telephone Company of Chicago.

787,658—J. A. Baker. Induction Coil.

This is an induction coil, or repeating coil designed to obtain the highest possible inductive efficiency from a given primary current without correspondingly increasing the resistance. The coil is divided into what I may term sandwiched windings, end on, the two end windings being tapered down, and being in the secondary, which thus contains one more coil than the primary.

787,879—C. E. Egan. Telephone Call or Ringer.

This is a ringer of the usual type with a permanent magnet polarizing its armature and cores, and having the

additional feature of a condenser F mounted parallel with and on the back of the permanent magnet. Claim 1 reads:

"1. In combination with the magnets of a telephone call bell, a supporting member therefor, and a condenser secured to said supporting member."

The condenser is rolled about a core, and is described as being made of wall paper with a gilt figure printed thereon. This is rolled upon the core and connected in the ringer circuit.

787,900—W. W. Dean. Plug and Spring Jack Switch.

This patent is assigned to the Western Electric Company, the application having been filed January 14, 1902. The invention comprises a three-wire jack and a three-conductor plug in which there is no possibility of getting a false test by the ring of the plug accidentally touching the jack sleeve or thimble, which occasionally happens with the ordinary tip, ring and sleeve arrangement. The tip of the present plug is made hollow, and a hollow contact corresponding to the usual ring is mounted inside, so that as the plug is inserted one of the jack springs rests on the outside of the tip, and the other one polks inside the tip.

A second point of invention is in twisting the tail strip leading out from the jack thimble under the contact spring, and mounting the insulated stop for the springs thereon.

787,929—C. T. Mason. Telephone Switchboard.

This patent, which is assigned to the Sumter Telephone Manufacturing Company of Sumter, South Carolina, covers a scheme for combined drops and jacks, in which the jacks are mounted in strips, and the drops, or rather target signals, are mounted individually. Contact springs under the jacks make connection automatically with co-operating springs on the drop structures, so that when a drop is pushed into place under its proper jack in the switchboard frame its circuit will be completed through the springs. The structure of the signal or drop comprises a frame carrying a horizontal magnet at its rear end, and a small eccentrically pivoted armature in front of the magnet, a long, light arm extending forward from the armature and carrying on its end a small target *g'* which is normally turned up inside the frame. When the armature j is picked up by the magnet the target is thrown down through a slot in the face plate so as to be visible on the front of the board; and at the same time the magnet short circuits itself through a pair of contacts, *m-i*, so as to hold up until a plug is inserted in its jack, when it is cut off.

787,930—C. T. Mason. Telephone Switchboard.

This patent also is assigned to the Sumter Telephone Manufacturing Company, and covers a mechanical self-restoring drop shutter annunciator which apparently might be made interchangeable with the target annunciator in the foregoing patent. The jacks are in strips, as before, the strips being spaced apart sufficiently for the drop structures to be slid in between them. As each drop is slid in a pair of contact springs upon it make contact with and complete the circuit through springs connected to its jack. The front end of the drop structure, with the shutter and restoring device, are shown in the figure herewith. The shutter is pivoted to swing up and down through a horizontal slot in the face plate, having a dog, *f'*, on the inside which normally catches under the lower edge of the armature and so holds the shutter up. When the armature is attracted the shutter falls by gravity, as shown in the figure. Underlying the shutter is a bell-crank swinging dog, *k'*, having one end bent up inside the casing to engage the shutter arm in front of its pivot, the other end bent down outside the casing to overhang the corresponding jack opening. When the plug is inserted it forces back this dog, which forces back the shutter and latches it.

787,936—C. H. North. Selective Signaling Device.

This is a very clever ringer structure meant to work upon plus or minus intermittent currents. Everybody knows the trouble met with in using ordinary polarized ringers with biasing springs for such purposes. Here we have a straight electromagnet, *e*, mounted in a frame, *f*, in which is pivoted a spindle, *r*, having short, drop armatures, *a* and *a'*, on its two ends lying near the ends of the electromagnet cores, but held away from them by a strong retracting spring, *s*. Straddling the spindle from end to end is the U-shaped permanent magnet, *m*, which keeps both the spindle and the armatures polarized. Pulsations of current of a direction to properly polarize the magnet core will attract the armatures, but reverse pulsations not. Intermediate of its length the spindle carries a clapper rod, the clapper coming up and vibrating between the edges of two gongs eccentrically mounted, one within the other.

787,969—D. A. Yoder. Registering Apparatus for Telephone Exchanges.

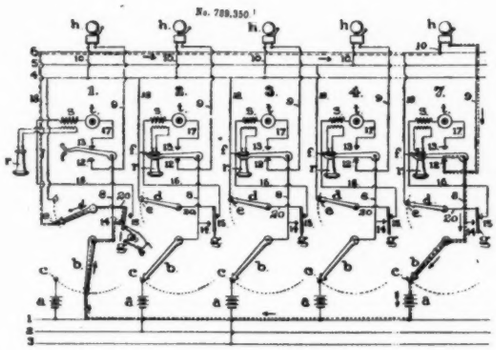
The invention in this case has a purpose somewhat simliar to that of the former operator's register of Mr. Yoder's, which I noticed some time ago. The scheme is to start up the register whenever a call comes, and run it mechanically until the call is answered, the total readings giving the operator's time of actual employment. The trouble with this scheme, and it is a basic one, is that when an operator is very busy there is no piece of apparatus at her position which can be relied upon to work this apparatus. Of course, when the calls come singly the pilot relay can be used, but when they come so as to overlap I should imagine the trouble would begin.

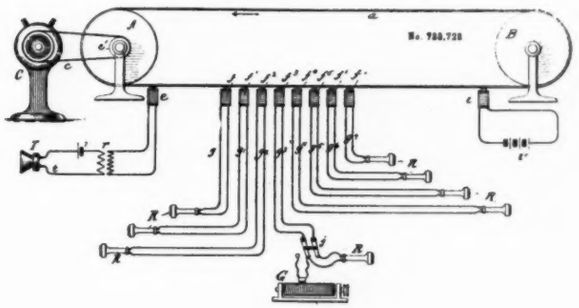
As shown in the drawing, the device comprises a motor constantly driving a jack shaft *s*, from which the register spindles are supplied through branch shafts connected through miter gears. Veeder cyclometer registers are shown, each having a small disk clutch, the idle part of which is geared to the branch shaft and is coupled up with the register part when a magnet is energized. This is all there is to it. When the magnet is energized the register runs, otherwise not.

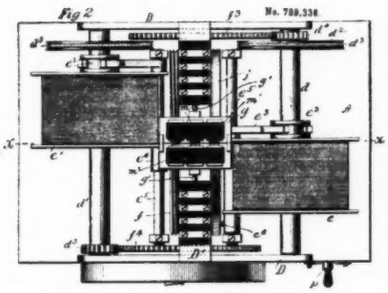
788,452—H. P. Clausen. Telephone Transmitter.

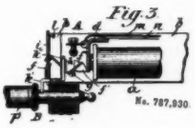
The Kellogg Switchboard and Supply Company has had an idea that it controlled what is commonly known as the reversed solid back, through the Dean patent 687,499. Mr. Dean is as modest as his inventions are remarkable, and therefore I need not apologize to him when I say that the Kellogg company's attitude has been as remarkable as his claims have been modest. Starting out some time ago, presumably under the genial direction of some of the able inquisitors of the Bell company, the Kellogg conglomeration has shown a disposition to bulldoze any and every competitor who dared to make a good transmitter. I am perfectly willing to admit the divine right of the most excellent and illustrious Bell company, and must plead guilty to the charge of *lese majesté* in daring to think independently. Apologizing for the offense of existing, we must still look with some satisfaction upon the many designs for transmitters and other sacred apparatus which continue to appear. Mr. Clausen here presents another.

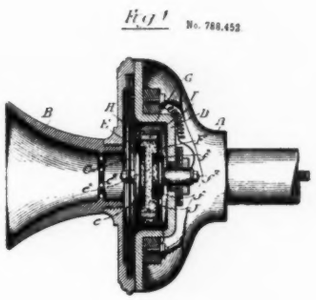
In this instrument the smaller electrode is fixed on a stud in the bridge, constituting the piston, and the larger electrode is fixed on a stud carried by the main diaphragm. Each electrode is surrounded by and carried upon a mica auxiliary diaphragm, both these little mica diaphragms being clamped around their edges to a circular pill-box rim, the granular material being thus enclosed. No special insulating strips are required, and a double or nearly double amount of flexibility is obtained.

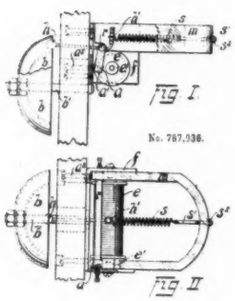


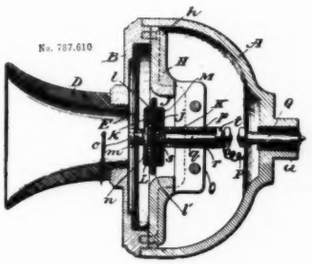


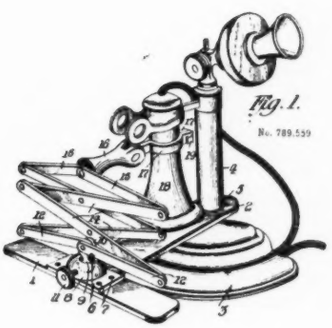


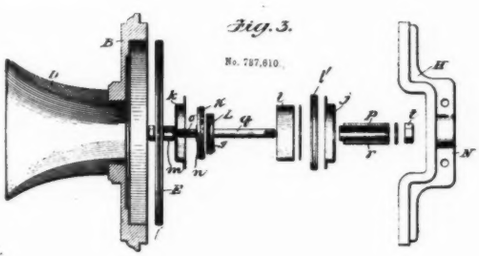


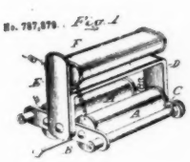


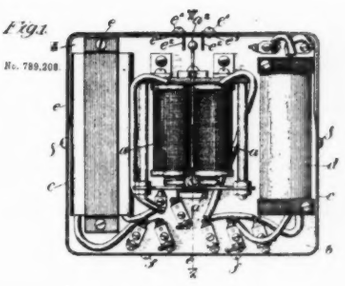












788,728—V. Poulsen. Apparatus for Electromagnetically Receiving, Recording, Reproducing and Distributing Articulate Speech, Etc.

This is Valdemar Poulsen of Copenhagen, Denmark, and he wastes a lot of words in designating what is merely a wire telegraphone. The receiver, *c*, responding to the transmitter, *T*, impresses on the passing wire, *a*, a chain of little hills of magnetism, corresponding to the sounds uttered in the transmitter. This chain of hills stays on the wire, and as it is carried along like moving scenery past the magnets, *f*, *f'*, f^2, etc., it sets up in them and in their windings impulses which when propagated in the circuits, *g*, *g'*, etc., cause the receivers, *R*, to talk again in manifold the original words. At least that is the intention. When the chain of hills reaches the magnet, *i*, which is constantly energized, they are swallowed up as completely as the Chinese hills by the fabled dragon, and the wire goes around on its return trip clean and bare.

788,924—C. T. Mason. Telephone Switchboard Annunciator.

This is another patent assigned to the Sumter Telephone Manufacturing Company, for a combined drop and jack, mechanically self-restoring. The jack frame and tube is cut out on top to accommodate a ball *10*, and the drop, which is pivoted to fall inwards, has a tongue *11* which then rests on the ball. When a plug is insetted it lifts the ball and throws up the drop.

789,087—C. D. Ehret. Art of Electrical Wave Transmission.

This is a method of boosting telephone currents by adding energy to the waves after they have traveled a long distance and have become attenuated. In a nut shell, the invention consists in putting on an induction or a synchronous generator, which is the same in construction as a motor of the same type, but is driven above synchronous speed, the machine then operating to add energy to the circuit to which it is connected, the frequency of the added energy being the same as that of the impulses on the line and on the primary winding, which establishes the initial field. In this patent the method is claimed, the broadest claim embodying the idea above stated, and the thirty-three other claims relating to various details of management of leakage, inductance and capacity.

In the figure herewith, *I* are supposed to be the boosters.

789,124—C. D. Ehret. Electrical Wave Transmission.

This is the apparatus patent for the same method just discussed.

789,188—H. Tideman. Combined Drop and Jack for Switchboards.

This is a mechanically self-restoring drop and jack. The parts are all mounted on a front plate, *1*, the magnet being of the tubular iron-clad variety. The jack springs are secured at the rear end onto and below the magnet tube, the drop shutter is pivoted on the lower part of the front plate, below the pack tube, and is normally held up by the usual hook on a rod extending back over the top of the magnet. The jack tube comes forward through a slot in the drop, and the drop itself is provided with an angle arm extending in at its lower end, and when the drop is down turning up into the path of the plug as shown in the figure herewith. As the plug is inserted the arm is forced down and the drop is thereby forced up. A cross pin in the arm closes the night alarm contacts as it goes up.

789,208—H. M. Crane. Signal Instrument for Telephone Substations.

This patent is assigned to the Western Electric Company, and covers a signal device in which the casing takes the place of the ordinary gongs. The ringer magnets, *a*, are mounted on a base and surrounded by the metal casing, *c*, which has a couple of projections, e^2-e^2, adjustable on the top of the casing by a movement similar to the ordinary gong adjuster. The clapper lies between these two projections, and strikes them alternately. The metal cover is of resonant material, and the base plate is cut away around the upper half so as to leave the cover free to vibrate.

789,210—W. W. Dean. Toll Box for Telephone Pay-Stations.

This patent also is assigned to the Western Electric Company. It covers a coin collector for toll-stations of the class in which the coin must be first deposited in order to call central. When the connection is obtained the operator throws over a reversing switch in the cord circuit which sends reversed current to the calling subscriber's station, causes the armature of a polarized locking magnet thereat to be tilted, and thereby does several things. In the first place, the talking set is short-circuited, the slide containing the coin is unlocked so it can be pushed in, and finally a sign is displayed inviting the subscriber to push in his slide, which has a button on the outside for that purpose. When the slide is thus pushed in the coin is carried inside the casing and a door in the slide drops as it passes in, while at the same time a spring *h* comes down on the coin and shoves it violently downward into the till. The philosophy of this violence is this: If a cord or wire is attached to the coin it must be a fine one to pass through the crannies around the slide; and such a cord or wire would be broken by the violent push referred to. When the slide is thus pushed in and the spring *h* shoves down, the rear end of the spring flies up and breaks apart the springs i'-i^2 in the circuit of the controlling magnet, the condition then being that one side of line is broken and the other side grounded. This affects the supervisory relays at the central office to close the circuit of a tripping magnet for the reversing switch heretofore mentioned, and the latter is released to restore battery in normal direction to line. The polarized magnet at the substation is thus energized in the proper way to swing down its armature, lock the slide, and withdraw the sign, also breaking the short-circuit around the telephone set so the subscriber can talk to his correspondent.

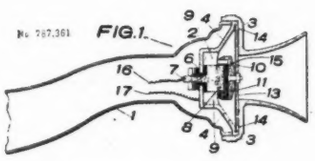
789,256—A. J. Carter. Electrical Test Set.

This is a convenient arrangement of a test set for linemen and others, comprising a generator with both terminal tip and commutator contacts, so that both alternating and pulsating current can be taken off. A pair of line binding posts and a pair of keys similar to ringing and listening keys are mounted on the top of the box, the connections being such that by throwing the keys one way or the other various connections can be conveniently made.

789,336—V. Poulsen, P. O. Pedersen and C. Schou. Telegraphone.

This is an improvement in the construction of the telegraphone heretofore noticed, having two spools for the wire, one on each side of the machine, which is generally of the appearance of a phonograph outfit. As the wire is fed across the magnet poles it unwinds from one spool and onto the other, and when the end of this travel is reached the motion is reversed. On the top of the device the three magnets shown are mounted, with double poles, on opposite sides of the wire, the middle magnet being the recorder and the others obliterating or "cleaning" magnets, working one at a time according to the direction of the feed. Cam motions are provided for reversing the feed, etc.

789,345—F. R. Welsh. Memorandum Attachment for Telephones.


No. 787,361
FIG. 1.

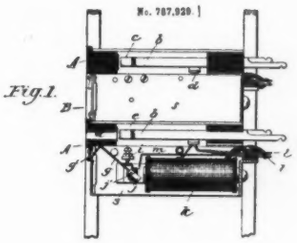

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Fig. 1.

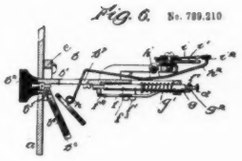
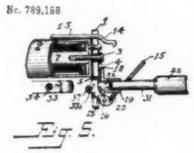


Fig. 6. No. 789,210


No. 789,168
Fig. 5.

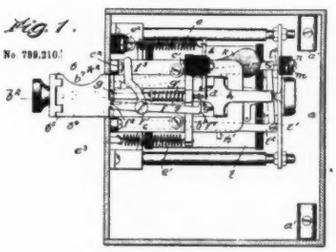


Fig. 7.
No. 789,210.

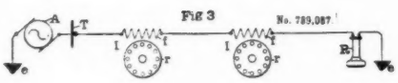
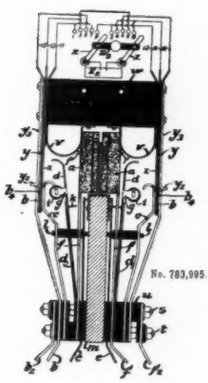


Fig 3
No. 789,087.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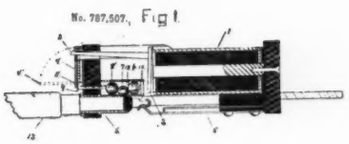
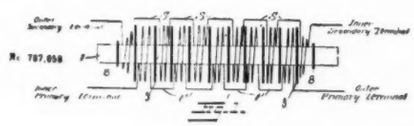

No. 787,507. Fig 1.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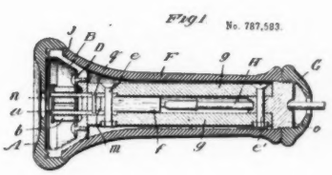


Fig 1
No. 787,583.

Fig. 3.
No. 787,900.

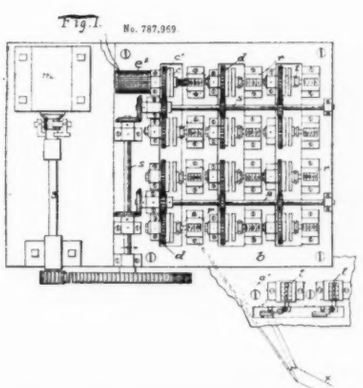


Fig. 1.
No. 787,969.

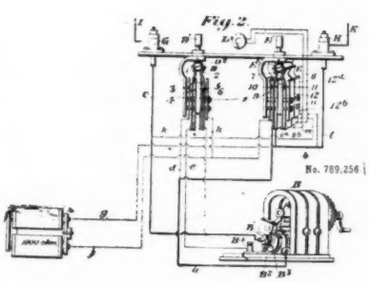


Fig. 2.
No. 789,256.

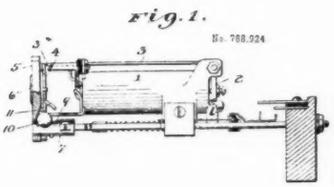


Fig. 1.
No. 788,924

This is a pad holder for desk sets comprising a bent wire rectangular frame with the ends projecting on one side to form a clamp which is placed about the upright standard of the desk set and set by a yoke with screws. Across the rectangular frame are metal bands with clips for the pad or memorandum sheets. It looks like a practical device for those who desire a holder of the kind.

789,350—A. K. Andriano. Interconnecting Telephone System.

Mr. Andriano has assigned this patent to the Direct Line Telephone Company of San Francisco. He has done considerable work in intercommunicating or house systems before. In this case he uses two groups of conductors, each station being normally connected on one side to a definite conductor of the other group, a number of combinations being thus effected, which economizes wires. The calling station always sets two hands, one onto the wire of one group with which the desired station is connected, and the other with the other. The batteries are local, one for each station, each connected in the short branch from its station to the "direct line conductor." When the setting hands are moved around to select in calling another station, the local battery is cut off and the battery at the other station is used. There are several ingenious details of mechanism employed.

789,559—A. L. McSweeney. Attachment for Telephones.

This is a lazy-tongs assigned to the job of holding the receiver. It is not a bad scheme, but I am afraid it makes a complicated lot of wearing parts and surfaces. A base *1* is clamped to the wall set backboard, or as shown in the cut herewith, to the desk set standard, and on this base a lazy-tongs movement is mounted with a universal joint at its lower end and a pivoted ring-clamp at its upper end to hold the receiver, *18*. There is enough movement, and it is free enough, to permit the receiver to hang on the hook in a normal and Christian manner, which most of these devices do not, and when the receiver is wanted up at the ear it is supposed to be held there, its weight being then sustained by the tongs.

789,651—C. L. Burlingham and W. J. Burton. Electrical Conductor.

This is a flexible conductor, shown as a switchboard cord, composed of two conductors twisted in a single spiral, and each consisting of an inner wire having strength and spring, like steel or brass, with a fine copper wire wrapped around it to give conductivity. Usual insulating means are employed.

789,652—W. J. Burton. Switchboard Cord.

The invention in this case is aimed at the faults caused by cords breaking down at the bend by the plug. The general construction of the cord is substantially the same as that just before noticed. In addition to the twisted and reinforced conductors, a so-called flexible rod is inserted from the plug end into the cord, so as to take the strain of the bend off the conductors. It consists of a heavy insulated twisted wire.

"POLYGLOT" AND THEN SOME.

The latest telephonic pipe dream comes from Le Sueur, Minnesota, in the form of a newspaper "special," and is as follows:

"Delosiro Fhowiler, an eminent Japanese scientist, formerly of Mankato, but now residing in Le Sueur, has perfected and patented what is probably the most remarkable invention of the age. He calls it the 'polyglot telephone transformer' and has formed a stock company and issued 300,000 shares of $1 each. The shares now are selling like hot cakes at 10 per cent above par.

"The invention is used as follows: It is connected with any ordinary telephone system, and, when a person desiring to use the telephone has called up a person he desires to speak to, if it should chance that the listener speaks a foreign language not understood by the speaker, the speaker presses in a key in the instrument, marked 'German,' 'French,' 'Latin,' 'Russian' or any one of fifteen modern or ancient languages, based on the Greek, Latin and Teutonic tongues, or derived from the Aryans, and the machine instantly transforms the spoken words of the language used by the speaker into the words of the language understood by the listener. It will not work on languages not allied in their basic formation; for instance, the Chinese and Japanese languages cannot be transformed.

"The machine is a wonderful and beautiful creation, consisting of twenty-three thousand different parts, and it makes an adding machine or a typewriter look as simple as a ladder. It stands six feet high and is ten feet long and four feet deep, inclosed in plate glass and fairly covered with shifting devices, knobs and push buttons.

"It is going to be of great use in the teaching of the different languages, for all one has to do is to talk English, or any other tongue, into the transmitter, and hold the receiver to his ear, with the proper push button in, and he gets the meaning of what he is saying in English ground out to him in the best French, Norwegian, or whatever language he desires."

A GROWING INDEPENDENT SYSTEM.

J. B. Marquis, Jr., proprietor of the Marquis Telephone Company of Norwich, New York, has purchased 5,000 feet of telephone cable, and will commence the work of installing the cable in the center of the town. The Marquis system, which was established in 1895, with only three telephones, had a steady growth until in January, 1904, it had 417 telephones. The business has increased fifty per cent during the past year and Mr. Marquis now has 620 subscribers, and a large Independent line. He has established working relations with other Independent lines, and about June 1 expects to make connections which will afford a through line from Utica to Elmira. After the cables have been installed a new and improved central energy system switchboard will be added to the equipment.

TELEPHONING TO A PHONOGRAPH.

The disadvantages inevitable in telephoning have been partially overcome by an instrument of foreign made—though the general serviceability of the device has not been demonstrated by usage in this country. It may be described as an ordinary telephone with a phonographic attachment. While Mr. Jones is in his office the attachment is not in use, but on going out he connects it with the telephone. When someone calls for Mr. Jones over the telephone, the phonographic attachment responds something after this fashion: "Mr. Jones is not in. This is a phonographic receiver speaking. Kindly give me your message and I will repeat it to him on his return." On coming in Mr. Jones sees from a signal that a message is waiting him. He takes the receiver and the phonograph delivers the messages (perhaps there are many) that have been confided to it.

A compilation of rural telephone statistics shows that there are now upwards of 300,000 rural telephones in use on Iowa farms, which are connected with local exchanges over the state, and that this number is increasing with a rapidity that bids fair to give the state over 400,000 rural telephones in another eighteen months.

Conventions of Independents

WEST VIRGINIA INDEPENDENTS ORGANIZE.

THE West Virginia Independent Telephone Association was organized May 9 at a meeting of representatives of Independent telephone companies of West Virginia, held at Parkersburg. Officers were elected, and the preliminary plans for a complete mutual state service were outlined and will be carried into effect. The association will bring about complete long-distance service over all parts of the state in competition with the Bell company, and cheaper rates are promised.

The following officers were elected in the formation of the permanent organization:

President—J. Walter Barnes, Fairmont, manager Consolidated Telephone Company.

Vice-Presidents—First district, W. C. Handlan, Wheeling, general manager National Telephone Company; second district, W. C. Cayton, Parsons, manager Parsons Telephone Company; third district, J. W. Downs, Buckhannon, manager Buckhannon Telephone Company; fourth district, W. L. Rector, Ravenswood, manager Ravenswood Telephone Company; fifth district, Lon H. Hutchinson, Huntington, manager Huntington Mutual Telephone Company.

Secretary—A. C. Davis, Parkersburg, general manager West Virginia Western Telephone Company, Parkersburg, and Marietta Telephone Company of Marietta, Ohio.

Treasurer—Lloyd Beeghley, Weston, manager Beeghley Telephone Company.

The following persons constitute the executive committee of the association: J. Walter Barnes, ex-officio president, Fairmont; H. P. Dixon, Charleston, manager Charleston Home Telephone Company; Lon H. Hutchinson, Huntington; W. C. Handlan, Wheeling; A. C. Davis, Parkersburg.

Two delegates were elected to attend the National convention in Chicago, June 20, 21 and 22—J. A. Hamilton of Mannington and Lon H. Hutchinson of Huntington. The executive committee was empowered to choose two additional delegates. No district delegates were elected.

The executive committee will have the power to carry into execution all of the plans for a state telephone service, which will be done on the same basis as has been established by the Ohio Independent Telephone Association, which has meant a working arrangement of all telephone companies independent of the Bell. The movement, at present state wide, will eventually assume greater proportions. President J. Walter Barnes was chosen as a member of the advisory board of the National Independent Telephone Association. The West Virginia Association thus becomes a member of the national body, and when the plans are fully carried out this will mean that the whole system of Independent telephone companies will have a working arrangement which will bring about a long-distance service to all parts of the country.

The executive committee will plan to bring about a uniform rate system, in proportion with the distance of separation of points placed in communication, a uniform copper wire system, and an arrangement for the actual connection of all of the Independent systems so that each may reach all points in the state where there are Independent telephones over the wires of the others.

It is proposed to organize the state thoroughly, and to this end the state has been divided into five districts. However, it will require some time before the state is thoroughly organized.

Parkersburg will be the headquarters of the state system. The whole scheme was the plan of Manager A. C. Davis of the West Virginia Western, who wrote a number of letters. Every company in the state was addressed and practically every Independent line, large and small, is in the association. The following named companies were represented at the meeting:

West Virginia Western Telephone Company, Parkersburg.
Consolidated Home Telephone Company, Clarksburg.
Charleston Home Telephone Company, Charleston.
Huntington Mutual Telephone Company, Huntington.
Mason City Telephone Company, Point Pleasant.
National Telephone Company, Wheeling.
Enterprise Telephone Company, New Martinsville.
People's Telephone Company, Morgantown.
Buckhannon Telephone Company, Buckhannon.
Western Central Telephone Company, Burnsville.
Bigley Telephone Company, Weston.
Parsons Telephone Company, Parsons.
Piedmont and Keyser Telephone Company, Piedmont.
Ravenswood Telephone Company, Ravenswood.
Smithfield and Mannington Telephone Company, Mannington.
Pine Grove Telephone Company, Pine Grove.

After the association had been formed and a permanent organization effected, the meeting adjourned to convene again at the call of the president. In the meantime the executive committee will get busy and prepare to carry into effect the plans as outlined. A comprehensive report will be made at the coming meeting.

* * *

DISTRICT MEETINGS OF MICHIGAN INDEPENDENTS.

At the initial business meeting of first district members of the Michigan Independent Telephone Association, recently held at Northville, that state, it was decided that $20,000 will be spent within the next two months for the improvement of the Independent toll line service between Detroit and Lansing, Detroit, Ann Arbor and Jackson, Detroit and Northville, and Detroit and Holly. New double copper circuits will be installed, and in all 480 miles of copper wire strung. The work between Detroit and Lansing will be done by the Peninsular Telephone Company, Detroit; Livingston County Telephone Company, Howell, and the Citizens' Telephone Company, Lansing; between Detroit,, Ann Arbor and Jackson, by the Peninsular Telephone Company and the Washtenaw County Telephone Company, Ann Arbor; between Detroit and Northville, by the Peninsular Telephone Company; between Detroit and Holly, by the Peninsular Telephone Company.

R. B. McPherson of Howell, president of the Livingston County Telephone Company, was elected president, and F. H. Howard of Flint, auditor of the Valley Telephone Company, secretary of the first district body. President McPherson was chosen delegate to the National convention to be held in Chicago. Delegates to the coming Michigan state convention were named as follows:

M. A. Porter, Northville, Northville Telephone Company; C. B. King, Ann Arbor, Home Telephone Company; L. C. Kanause, Byron, Byron County Telephone Company; A. G. Briggs, Pontiac, Oakland County Telephone Company; C. T. Babcock, St. Johns, Union Telephone

Company; Stanley E. Parkhill, Owosso, Union Telephone Company; F. M. Howard, Flint, Valley Telephone Company; F. M. Monroe, Williamston, Williamston Home Telephone Company; F. C. Hughes, Lansing, Citizens' Telephone Company; Clarence M. Burton, Detroit, Peninsular and Co-Operative Telephone Companies.

The second district members of the Michigan Independent Telephone Association held their first meeting at Jackson. The district comprises the counties of Monroe, Lenawee, Hillsdale, Branch, Jackson, Calhoun (part), Ingham and Washtenaw.

Representatives from every important town in each county were present and several of the cities sent a number of representatives. The meeting was called to order at 10 o'clock and the session continued throughout the day.

The convention was styled by the leading representatives as a mutual benefit convocation and matters of importance relative to construction and operation were debated. The object of the meeting was a better consolidation of district interests, and discussions of the various branches of work were launched that the delegates might have a clearer understanding of affairs in the several counties.

Officers were elected as follows:

President, A. C. Smith, Homer; secretary, Dr. J. C. Buell, Rives Junction.

Delegates to state convention: Monroe county, F. W. Grodolph, E. P. Shafer; Lenawee, John Rentz and J. Lee; Hillsdale, C. G. Sherk and F. E. McConnell; Calhoun, Harry Taylor; Branch, T. A. Hilton and A. C. Hinebaugh; Jackson, N. F. Wing, J. C. Buell, J. C. Smith; Ingham, N. G. Dean and W. H. Graver.

District committee, Monroe county, F. W. Grodolph, Dundee; Lenawee, John Rentz, Blissfield; Hillsdale, W. H. Blaudeit, Jonesville; Branch, A. C. Hinebaugh, Burr Oak; Jackson, R. C. Fowler, Springport; Ingham, Mason Reynolds.

* * *

CALIFORNIA INDEPENDENT TELEPHONE ASSOCIATION FORMED.

At a meeting held in Los Angeles, Wednesday, May 5, in the office of the Home Telephone Company, an association of Independent telephone companies was formed, to be known as the California Independent Telephone Association. The aim of this organization is to bring about closer relations between the various Independent telephone companies operating in California. Meetings will be held the second Tuesday of each month, when matters pertaining to betterment of service and the requirements of the various communities will be considered and acted upon. A constitution and by-laws were adopted and the following officers elected:

President, John Van Liew, Los Angeles; first vice-president, D. S. Parker, Pomona; second vice-president, Roscoe Howard, San Diego; secretary, P. T. Spencer, Whittier; treasurer, Will L. Drew, Compton.

Members of executive committee: K. C. Wells, Redlands; W. J. G. Lambert, Riverside; A. L. Orton, Pasadena; P. Kerr Higgins, Los Angeles.

Few people realize the progress the Independent telephone movement has made in southern California. The fact was brought out at the meeting that more than $10,000,000 is invested in the telephone plants of the various Independent companies, which are now operating thirty exchanges with over 30,000 telephone and toll line circuits, reaching 110 towns in southern California, all this having been accomplished in less than two years.

* * *

INDEPENDENTS OF THREE STATES MEET.

Managers of Independent telephone plants in southwest Missouri, Indian Territory and northern Arkansas recently held their spring meeting in Joplin, Missouri. The session was held in the offices of the Home Telephone Company and was attended by the complete membership. The officers of the association present are: W. F. Stahl, Siloam Springs, Arkansas, president; S. H. Slaughter, Gravette, Arkansas, vice-president; K. G. Comfort, Westville, Indian Territory, secretary; D. W. Wasson, Sulphur Springs, Arkansas, treasurer.

The object of the association is the mutual exchange of ideas and the general promotion of telephone interests among its members, to the end that each may be enabled to give better service, both local and long-distance.

The visitors were taken on a tour of inspection, being shown the construction of the Joplin lines, under the guidance of local manager H. E. Scovern of the Home Telephone Company.

The meeting adjourned to convene in Neosho on the second Tuesday of next September.

* * *

NEW YORK INDEPENDENTS TO MEET IN JUNE.

The annual convention of the New York State Independent Telephone Association will be held in the common council chamber, city hall, Albany, New York, June 16. A good programme has been prepared, and from the present indications the attendance will be large. The officers of the association are as follows:

President, H. H. Persons, Buffalo; first vice-president, Howard Hendrickson, Albany; second vice-president, Boyd McDowell, Elmira; treasurer, T. Harvey Ferris, Utica; secretary, T. S. Lane, Buffalo.

The members of the Executive Committee are: H. H. Persons, Buffalo; George R. Fuller, Rochester; B. G. Hubbell, Buffalo; Edward Davis, Binghamton; S. B. Rawson, Albany; J. S. Brailey, Jr., Utica; C. H. Poole, Utica; T. B. Basselin, Croghan; F. M. Potter, Jr., Syracuse; J. F. Stockwell, Oswego.

Some very effective work has been done throughout the state during the past year by the organization of district associations, which form a part of the state association. The following districts have been organized.

Buffalo—Chairman, H. H. Persons, Buffalo; secretary, T. S. Lane, Buffalo.

Rochester—Chairman, George R. Fuller, Rochester; secretary, F. S. Bronson, Geneva.

Hornellsville—Chairman, H. M. Bennett, Hornellsville; secretary, C. M. Kelly, Hornellsville.

Binghamton—Chairman, J. B. Marquis, Jr., Norwich; secretary, M. L. Sternberg, Lisle.

Albany and Troy—Chairman, W. L. Burke, Troy; secretary, S. M. Strong, Schenectady.

Jamestown—Chairman, W. H. Homewood, Jamestown; secretary, John H. Wright, Jamestown.

Syracuse—Chairman, F. M. Potter, Jr., Syracuse; secretary, H. W. Fluhrer, Auburn.

Further information relative to the convention can be secured by addressing the secretary, T. S. Lane, 332 Ellicott street, Buffalo, New York.

* * *

INDEPENDENTS MEET AND CLOSE DEAL.

About thirty Independent telephone men attended a meeting held recently at Council Bluffs, Iowa, for the purpose of discussing matters connected with the telephone interests that have developed since the Independent franchise was granted here. These men represented the Independent telephone business of southwestern Iowa and a part of Nebraska. In addition to agreeing upon toll rates and connections with the Council Bluffs exchange they took $40,000 worth of stock of the local company.

The telephone men were taken to the Grand hotel at luncheon and given a taste of Council Bluffs hospitality. Mayor Macrae presided and Congressman Smith told some funny stories while outlining the plans of the local company for giving an outlet so long desired by the smaller

Independent companies. After the meeting the telephone men met at the office of Engineer Judson and spent the entire afternoon in discussing plans.

Representatives of each company entered into the general agreement to connect with the Council Bluffs toll lines with copper wire circuits. The agreement to take a financial interest in the Council Bluffs company was in fulfilment of the promise when the committee from the Independents came before the Commercial club asking its aid in getting connection with Council Bluffs.

Representatives of the companies at Woodbine, Harlan, Avoca, Shenandoah, Onawa Denison, Shelby, Modale, Des Moines, Red Oak, Corning, Audubon and Plattsmouth were present.

* * *

SETTLE TOLL LINE QUESTION.

The executive committee of the Northern Indiana and Southern Michigan Toll Line Association held a meeting in the office of the Home Telephone Company at Plymouth Indiana, on May 3. The meeting was called by the president for the purpose of settling some differences and establishing boundary lines between some of the members of the association. The differences were adjusted satisfactory to all parties concerned.

The officers and members of the executive committee are Theodore Thorward, president, South Bend; J. K. Johnston, secretary and treasurer, Elkhart; Claude R. Stoope, Nappanee; C. A. Reeves, Plymouth; J. W. Scott, Warsaw. The committee adjourned to meet May 11 at Leesburg. They will then take up the question of territorial rights between two companies. The committee has been very successful in adjusting all differences between members of the association, and they can heartily recommend to all Independent telephone companies the necessity of a like compact.

* * *

ISSUES CALL TO INDIANA INDEPENDENTS.

Theodore Thorward, president of the Indiana Independent Telephone Association, has furnished TELEPHONY with the following call which he has issued for the benefit of the members of the state organization:

"All Indiana Independent telephone men, and particularly the members of the Indiana Independent Telephone Association, are requested to meet at the Auditorium Hotel, Chicago, on June 20, at 9 o'clock a. m., for the purpose of considering the advisability of joining the International Association, and if so decided to elect delegates to the national convention and members of the advisory board. On account of the National convention being held in Chicago at this same time the executive officers of the Indiana association have deemed it unadvisable to have their state convention in June, feeling that the members of the association would not attend both conventions under these circumstances. We have, therefore, decided to hold the Indiana state convention at Elkhart, Indiana, about the middle of September, when we expect to have a programme that will be so interesting that it will attract Independent telephone men from all over the state."

* * *

TEXAS INDEPENDENT TELEPHONE ASSOCIATION.

At Dallas, Texas, on May 10 the Texas Independent Telephone Association held a meeting, at which time it was decided to become a member of the National-Interstate Independent Telephone Association. E. W. Dunaway of Paris was elected delegate to the National convention, to be held in Chicago in June. Other important business was transacted, and reports from all parts of the state showed that Texas Independents are up and doing, being nowise behind other states in the matter of progress. The officers of the association are: President, E. W. Dunaway, Paris; vice-presidents, E. R. Webber, Orange, C. W. Roberts, Abilene, W. P. Johnson, Corsicana; secretary and treasurer, J. B. Earle, Waco.

* * *

WESTERN PENNSYLVANIA INDEPENDENTS ORGANIZE.

Representatives of numerous Independent telephone companies in western Pennsylvania met May 15 at Cambridge Springs, Pennsylavnia, and organized the Western Pennsylvania Independent Telephone Company. Twenty-two telephone companies were represented, including Pittsburg, Cleveland, Buffalo, Erie and other concerns. The following officers were elected: President, Frank Hart Pittsburg & Allegheny Telephone Company, Pittsburg; secretary, H. B. Mitchell, Emlenton; treasurer, John H. Wright, Jamestown, New York. Contracts were let for additional wires between Meadville and Pittsburg and Meadville and Cleveland.

* * *

SOUTHWEST KANSAS INDEPENDENTS MEET AT WICHITA.

The Southwest Kansas Independent Telephone Association recently held its second annual meeting at the Carey Hotel, Wichita, Kansas. This association is a branch of the state association, and meets in Wichita every three months.

Officers of the association were elected as follows: President, C. E. Vandeventer, Kingman; vice-president, A. R. Champlain, Newton; secretary and treasurer, H. D. McVay, Wichita. Executive committee. William Sikes, Wellington; Harry Common, Winfield; J. C. O. Morris, Wichita; Robert Burns, Hutchinson.

* * *

SOUTHERN KANSAS TELEPHONE ASSOCIATION.

The Southern Kansas Telephone Association recently held a meeting at Neodesha. Members of the managements of all the Independent telephone companies in the various towns of that part of the state were present and discussed new lines. Great progress has been made by the Independent companies within the past year or so, and a large number of Independent toll lines are in existence between the various points supporting exchanges.

* * *

MISSOURI CONVENTION TO BE HELD IN JUNE.

The Missouri Independent Telephone Association will hold its annual convention at Sedalia, Missouri, June 8. An excellent programme of papers has been prepared and the meeting promises to be a successful one.

INDEPENDENT SYSTEM FOR NEW YORK CITY.

A representative of a New York newspaper was in Cleveland recently interviewing the officers of the Cuyahoga Telephone Company regarding the prospects and present condition of that company. The representative expects to prepare a series of articles, showing the development of the Independent telephone work throughout the United States. He stated that he is reliably informed that John Jacob Astor is greatly interested in the investigation of Independent telephone plants, and has about made up his mind to apply for a franchise for the construction of an Independent telephone plant in New York city. Rumors of this sort have been in circulation for the past year, and Charles Schwab's name also has been mentioned in this connection. If this latest report proves true it will be a great step forward for Independent telephony.

J. T. Shaw, a government engineer, is at present superintending the construction of a telephone system along the line of the big irrigating canals in the vicinity of Reno, Nevada. The line is being established to facilitate communication regarding canal conditions between owners of land and the office at the headgates.

Decisions Affecting Telephony

G. W. HAND

PERSONAL INJURY CASE IN VIRGINIA.

F. C. Bokker, a child of eight years, was sitting on a box on the sidewalk, in one of the streets of the city of Lynchburg of the above state, and seeing what he thought was a string hanging down through the limbs of an adjacent tree, he left the box and reached up and grasped the object. It proved to be an electric wire belonging to the Lynchburg Telephone Company, which had broken in some manner and had come into contact with a live wire belonging to the Lynchburg Traction & Light Company. The telephone wire was thus heavily charged and as a result the boy was badly burned about the hands and arms. Suit was brought against the telephone company and a verdict for $10,000 given by the jury which heard the case. This amount being deemed by the trial judge excessive he ordered it reduced to $5,000 under penalty of having the judgment set aside. The plaintiff accepted the reduction under protest and an appeal was taken. This statement will make plain the following rules of law as stated by the Court of Appeals:

"In legal contemplation it may be said that any unauthorized entry upon the premises of another whose title extends to the center of the earth downward, and without limit upward, by putting one's hand through or over a boundary fence, is a trespass. It would, however, certainly seem that the trespass had reached its vanishing point when such a trespass was committed by a child of eight years of age. The owner of the premises would find it difficult to maintain such defense if he had knowingly permitted so grievous a danger to exist within reach of a public street, and thereby caused an injury to one incapable of contributory negligence. The proof in this case is that the wire which inflicted the injury belonged to the Lynchburg Telephone Company; that it was a test wire No. 19; that it had been broken in divers places; that it had been broken where the injury occurred for three days (the little boy who was injured had seen it two days before the accident), and the telephone company had been informed of its condition."

In the view of the court these facts warranted the trial judge in instructing the jury that in failing to inspect and prevent injury by removing its wires from a dangerous position of the above nature the company would be negligent. The plaintiff having consented to remit one-half of the original verdict, the higher court would not hear him in seeking to set aside his own action in this regard.

Lynchburg Telephone Company v. Bokker, 50 S. E. 148.

DEFECTS AT OTHER TIMES AND PLACES DOES NOT PROVE A DEFECT AT A PARTICULAR PLACE.

Harry H. Lusby was killed in Baltimore, Maryland, by a powerful current of electricity having been conducted through his body as a result of accidental contact with a telephone wire which had broken in some manner and had, in falling, formed a circuit with a feed wire belonging to the United Electric Light & Power Company. Suit was originally brought against the Chesapeake & Potomac Telephone Company alleging that the company was negligent in allowing its wire to break and come into contact with the wire of the electric company, but at the trial a verdict was directed in favor of the telephone company by direction of the court. The plaintiffs then began suit against the electric company and a verdict for $9,000 was given. The appeal has recently been disposed of by the Court of Appeals. The plaintiffs in the lower court introduced much evidence that the electric company maintained wires at various other places in a dangerous condition, owing to defective insulation. The purpose of this testimony was to show that the wire at the particular place of the accident was by inference poorly insulated. The court said:

"The death of the deceased was not caused by the burning of the wires at other points or on other occasions, but was caused by contact with a telephone wire that had crossed a feed wire of the appellant company on the night of the accident. The testimony, therefore, was too remote and misleading, and presented an issue of negligence not involved in the case. There was also a want of identification of the wires."

And in quoting from City Pass. Railway Company v. Nugent, 38 A. 779, "for a mere accident, unmixed with negligence, or fault, no action will lie, because there has been no breach of duty that was owed and therefore no negligence." In the Lusby case one of the first conditions upon which recovery is always based—that of showing negligence directly causing the injury—was entirely wanting. The fact that at some other place the electric company had allowed its wires to become poorly insulated could not have the slightest bearing on the question of its liability for the death of Lusby. And until there had been a showing that connected a defective insulation at the precise place where the telephone wire crossed the electric wire at the time of the injury with Lusby's death there was no actionable negligence.

United Electric Light & Power Company v. State to use of Lusby et al., Court of Appeals of Maryland, 60 A. 248.

NO DUTY TO WARN OF DANGER, HENCE NO LIABILITY IN CASE OF INJURY.

A telephone lineman employed by the Central Union Telephone Company of Taylorville, Illinois, while engaged in stringing wires on a street along which the Taylorville Electric Company had its wires, and at a distance of some twenty-five feet from the ground, in handling a wire received a shock caused by the telephone wire coming into contact with a charged electric wire near by and fell to the ground and was killed. His administratrix sued the electric company for damages, alleging that it was responsible for the death. A custom of the electric company had been to blow a whistle five minutes before the current of electricity was turned onto the wires. The lineman of the telephone company and the electric light company relied on this signal to warn them of their danger. It was, however, given for the benefit of the employes of the electric light company and no agreement of any nature was ever made to so notify the employes of the telephone company; the latter nevertheless relied on the custom and rule for the benefit of the electric company's workmen. The electric plant was supposed to start at 4 o'clock each day and the telephone linemen planned their work so as to be through before that hour, but at the date of the injury it started earlier in the day. The duty to warn by means of the whistle extended only to the electric company's linemen, and the Supreme Court on these facts held that there was no right of action against the electric company, inasmuch as it owed the deceased no duty of a legal nature; there had been no agreement or understanding between the defendant and the plaintiff or the plaintiff's company, hence there was no liability.

Rowe v. Taylorville Electric Company, Supreme Court of Illinois, 72 N. E. 711.

Telephone Tales Tersely Told

The Ogle County (Ill.) Telephone Company, Lewis Berve, manager, will construct a line from Forreston to Freeport.

The Lafayette (Ind.) Home Telephone Company will spend $200,000 during the coming year in improving its already excellent system.

Plans are being formed for the consolidation of the ten or fifteen telephone companies in the vicinity of Paris, Illinois, with the intention of making a united effort to gain admission to Paris.

The Wisconsin general assembly, by a vote of 56 to 29, passed the bill requiring the Bell company to grant the use of its long-distance lines to the Independent telephone companies operating in that state.

After standing sixty-seven years, the oldest frame house in Racine, Wisconsin, is being razed to make room for a $25,000 brick exchange building to be erected by the Citizens' Telephone Company.

New automatic telephone boxes are now being installed by the Citizens' Telephone Company of Columbus, Ohio, and it is expected that all will be in and ready for use by the time the switchboard is completed.

The Inter-State Independent Telephone Company has purchased the exchange at Streator, Illinois, and has added that line to its large list of exchanges. The parties interested in the deal are principally the officers of the Aurora company.

The Centralia, Missouri, telephone system was sold recently to a local company for $32,500. The new company, of which J. W. Bryson is president, C. W. Settle vice-president, and Will McBride secretary and treasurer, is capitalized for $60,000.

The Logansport (Ind.) Home Telephone Company has 1,000 telephones in use, and 900 in use in the surrounding country. The company is preparing to receive 225 more patrons this spring. It has in all more than 2,800 subscribers on its lines.

The executive committee of the Iowa Independent Telephone Association held a meeting in Des Moines recently and as a result it is thought that President Lichty will be authorized to make a canvass of the state in the interest of the association.

A contract for the establishment of a telephone system between Las Vegas and Bullfrog, Nevada, has been made by the Bullfrog, Tonopah & Las Vegas Telephone Company. The line will traverse the marvelously rich gold region just opened up.

Preparations are being made by the Richmond (Ind.) Home Telephone Company to build a copper line to Hollandsburg. A new switchboard is being installed, which will make the local capacity 2,300. There are now 2,100 telephones in service.

A. B. Kerlin, of Devil's Lake, North Dakota, is planning extensive telephone line building for the summer. He contemplates building over 100 miles throughout Ramsey county and will install telephones in farmers' residences throughout the county.

The Inter-State Independent Telephone and Telegraph Company of Peoria, Illinois, which recently opened for business, has twenty-one miles of underground conduit construction and toll connections with Independent service covering entirely the state of Illinois.

The annual report of the South Bend (Ind.) Home Telephone Company shows 3,538 telephones in service, an increase of over 600 new subscribers for the year. Over 200 contracts are now being held awaiting the time when the company will be able to furnish service.

The Union Telephone Company, with headquarters at Alma, Michigan, will build 600 miles of additional copper toll lines this year, including lines from Alma to Saginaw and Claire, and an additional circuit from Alma to Edmore and Lake View, besides other lines.

It is stated that the Southern Independent Telephone Company, of El Paso, Texas, promoted by Mrs. Brett, and which has been promising to give El Paso a telephone system for the past four years and more, is now going to rush work and will soon have an automatic system installed.

The Commercial Telephone Company, capitalized at $100,000, has been incorporated at Las Cruces, New Mexico. The purpose of the company is the construction, maintenance, and operation of a telephone line in New Mexico. The term of existence is fifty years and the principal place of business Las Cruces.

The Glen Telephone Company of Johnstown and Gloversville, New York, recently purchased by the Bell company, on May 1 raised the rates of telephones in Fonda, New York. All business telephones are now $2 per month instead of $1.50, as formerly. The price of the residence telephones was not increased.

The Los Angeles (Cal.) Home Telephone Company will extend its lines to Escondido, National City, Corondo, Chula Vista, Paradise Valley and other sections of the county. From Escondido the line will be extended northward to Santa Ana, where connection will be made with the long-distance service of Los Angeles.

E. C. Sumner of the Independent Automatic Telephone Company of Spokane, Washington, which is seeking a franchise in that city, states that his company is willing and ready to spend from $600,000 to $1,000,000 in Spokane if granted a franchise. This company is now building long-distance lines in California.

The Black River Telephone Company of Lorain, Ohio, is making plans to compete with the Bell company, which recently secured a franchise to operate there. The company has awarded a contract for a new exchange building to cost $5,000, larger cables will be installed, and 1,000 additional telephones will be put in as rapidly as possible.

The El Paso Telephone Company of Colorado Springs, Colorado, will ask for a franchise to operate in that city. The company agrees to make a rate of $1 per month for residence telephones and not to sell out to the Colorado Telephone Company. After the company has been in operation for five years it agrees to give the city two per cent of its net earnings.

The appeal of the Queen City Telephone Company of Cincinnati from the decision of the Circuit Court has been filed in the Supreme Court. The Circuit Court decided that the Probate Court did not have authority to grant the company a franchise, on the ground that it was not properly organized. The decision of the higher tribunal will be watched with considerable interest.

Failing to make satisfactory terms with the Sunset Telephone Company, the Interior Department of the United States government will build a line running from Lake Tahoe, the head of the western Nevada irrigation system, to Fallon, by way of Reno. An exchange will be located at Reno and lines will radiate to different parts of the system. The service will be for government use only.

The Dakota Central Telephone Company of Aberdeen, South Dakota, has presented a petition to the city council asking permission to put its wires underground in the business part of the city. If permission is obtained the company intends to spend at least $30,000 in improvements on its local system. A central energy system will be installed. A new switchboard with a capacity of 4,400 will also be installed.

The Hastings (Neb.) Independent Telephone Company has let the contract to Lewis Ellis of that city for the erection of a handsome exchange building, the same to be completed on July 1. The company has also purchased 600 new telephones to be installed at once. Telephone poles have been purchased and will soon be on the ground, when work on the system will begin in earnest. Something over $50,000 has been subscribed, all by Hastings citizens, and over $10,000 has already been paid into the treasury.

The United States Telephone Company of Waterloo, Iowa, is preparing to rebuild and remodel its plant the present season at an outlay of between $350,000 and $400,000. The service at both Waterloo and Cedar Rapids will be equipped with up-to-date apparatus, and the lines between the two cities will be rebuilt. The new Independent lines will be constructed largely by Waterloo and Cedar Rapids capitalists, a number of men of large means having interested themselves in the construction of a modern telephone plant.

The Livingston County (N. Y.) Telephone Company, recently incorporated for the purpose of building telephone exchanges and toll lines all over the county, has purchased from the Inter-Ocean Telephone and Telegraph Company all of that company's property in Livingston county, including exchanges at Avon, Lima, Caledonia, and Geneseo, and has acquired its franchises and right of way in these towns and in Mt. Morris. This gives the company a system with more than 600 telephones now in operation and seventy-eight miles of toll lines.

The Great Falls (Mont.) Leader is authority for the statement that an Independent telephone system for Great Falls and for other Montana cities is projected by a Chicago company. It is the intention of the company to secure franchises in Helena, Great Falls, Butte, Anaconda, Missoula and Bozeman with the view of constructing Independent exchanges in all these cities to work in connection with the Independent exchanges in Billings, Red Lodge, and to connect these places by long-distance lines. The name of W. H. Crumb of the firm of W. H. Crumb & Company, Chicago, is mentioned in connection with the project.

Manufacturers' Department

SWEDISH-AMERICAN TELEPHONE COMPANY.

The Swedish-American Telephone Company of Chicago was organized under the laws of the state of Illinois in December, 1899, for the purpose of manufacturing all kinds of highest class telephones and central office equipment. The company started in business in a small way five years ago and is now ranked as one of the best established industries of its class in the country. This growth has been made in spite of close competition with the largest and most prosperous telephone manufacturing concerns. Their success is due because of the genuine merit and excellence of their apparatus during times when many companies were sacrificing the quality of their apparatus in order to meet competition or to increase their profits.

The first Swedish-American plant was located at 680 North Wells street, Chicago, at which time a floor space of only 200 square feet was occupied. Within a short time after their goods had been placed upon the market, their business had increased so rapidly that larger quarters were necessary, consequently the plant was moved to 71-73 West Jackson boulevard, where they were located until May 1, 1903, when, on account of lack of space, they were again compelled to move. They are now occupying the entire floor space of 175,000 square feet in a large seven-story structure, herewith illustrated.

HOME OF SWEDISH-AMERICAN TELEPHONE COMPANY.

The Swedish-American telephone factory is modern in every respect, being thoroughly equipped with up-to-date machinery and appliances. Each department is headed by a specialist in his line, who sees that each part is exactly right and that all assembling is carefully done. All work is performed by well-trained employes, who have had years of experience and who have their trade so well learned that it is very seldom any mistakes occur. A trip through this factory is full of interest even to those who are not familiar with the workings of a telephone.

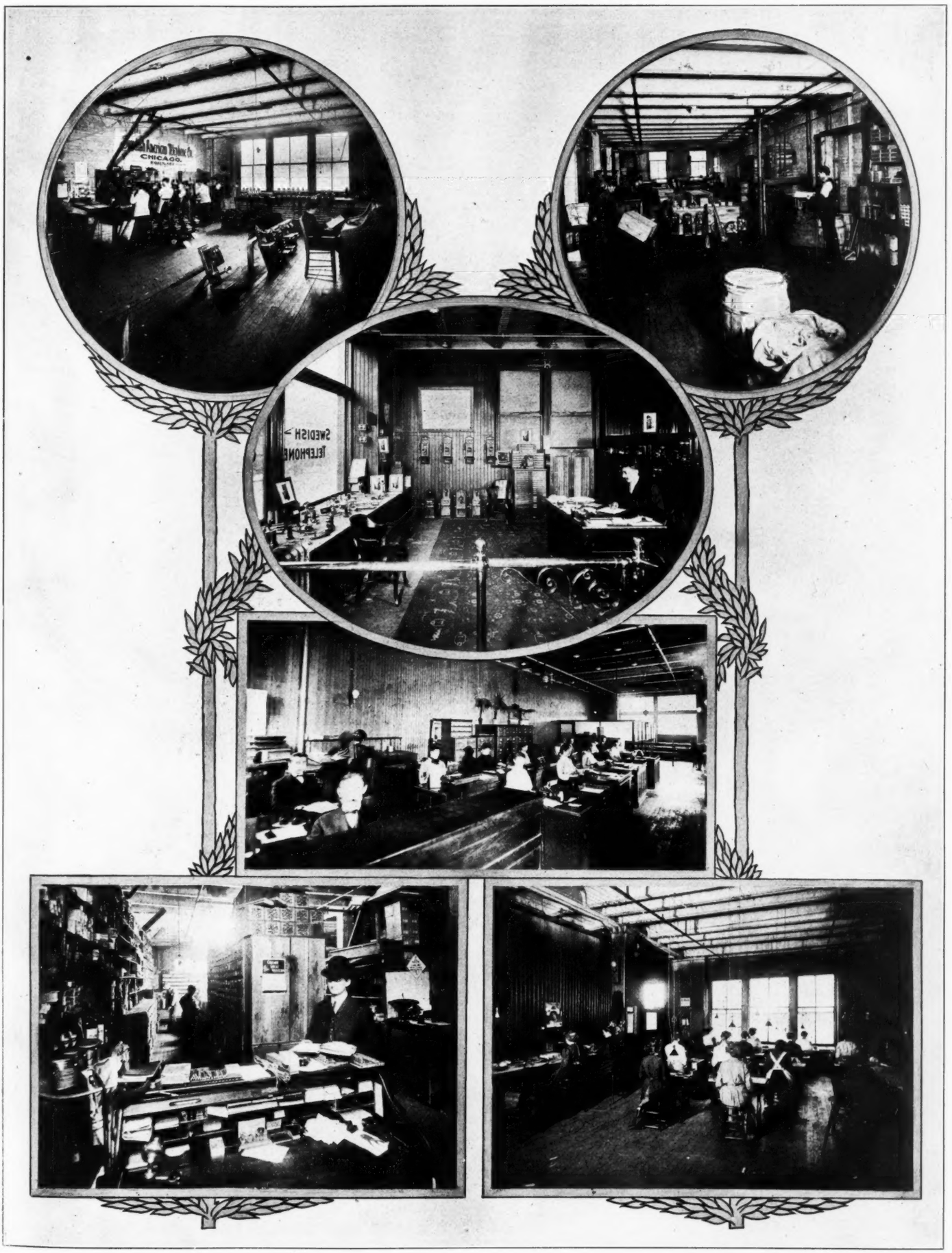
Each part of the telephone is made by special tools, and hand work, except for assembling, is almost entirely eliminated. This makes it possible to produce apparatus of the very best quality and at a very low cost. Of course, it requires a great deal of machinery to produce this result. Most of the machinery is automatic and to those who do not understand its construction it would seem as though it were endowed with intelligence. There are rows of such machines in the Swedish-American Telephone Company's factory, each doing its work without any apparent supervision. One might ask whether the expense of installing this complicated machinery is not so great that it would be an unprofitable investment. That would be true if the volume of business were not so great.

It is the policy of the Swedish-American Telephone Company to make only the best, and as the margin of profit is small where good material is used, the only way to do is to use the most modern methods. It is certainly true that "No telephone can be too good," and if we can judge by the increase of business, the customers are more than satisfied and the Swedish-American company is not going to too great an expense in producing its apparatus.

The company maintains an elaborately fitted electrical laboratory wherein all experimental work is done. Before any apparatus is placed upon the market, it is given to the laboratory engineers to be put through all manner of tests to ascertain whether there is any weakness that may develop; these tests are conducted to develop durability, efficiency and simplicity. In this laboratory are all kinds of electrical measuring instruments and a number of special machines are also used to assist in making breakdown tests on the apparatus. After the engineering department has finished its test, the apparatus is most thoroughly standardized. The quality of all material used in the manufacturing of telephone parts is passed upon by the laboratory engineers and chemists after conclusive tests are made.

Besides the laboratory, and working in conjunction with it, is a testing department. Here every piece of apparatus made by the company is given a rigid service test, much more severe than the parts will have to endure in actual commercial use. No telephone or switchboard is allowed to leave the factory without having been through the inspecting department and having a tag attached vouching for correct action of the apparatus. Every convenience in the line of testing apparatus is provided, including storage batteries, special plugs and cords, ringing current, rheostats and special testing circuits, as well as every possible contrivance which will facilitate the work.

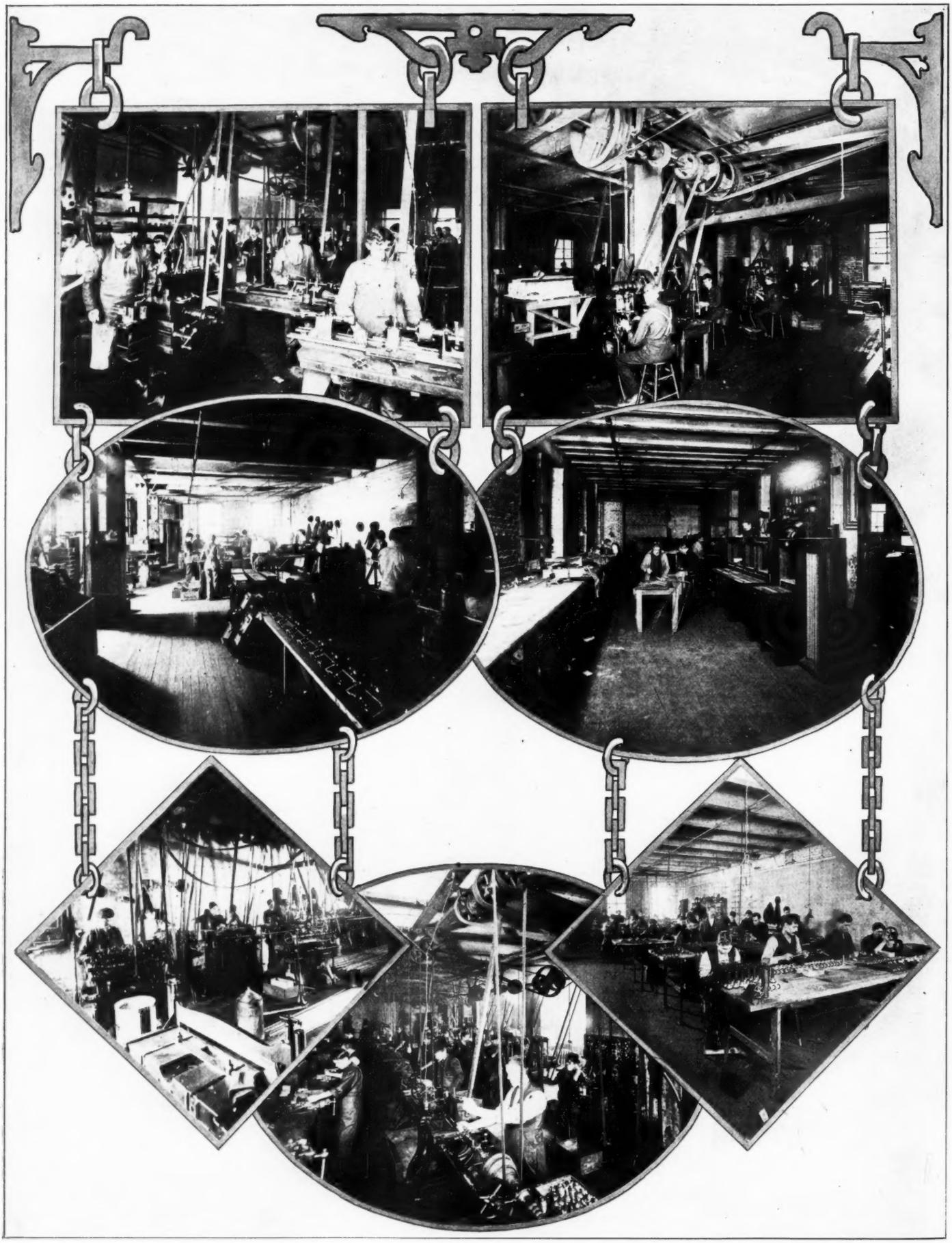
The transmitter department deserves especial mention. The assembling of this portion of the telephone is done in a room separated from the rest of the factory by an air-tight partition in order to keep out the dust and dirt. As the transmitter is more sensitive to trouble than any other part of the telephone, it is of great importance that all work in its assembling shall be done in a clean room. The workmen in this department are especially skilled and accurate, their work being so particular that to do it properly they must have the skill and delicate touch of the watchmaker.



Stock Room.
Telephone Testing Department.

Display and Salesroom.
General Office.

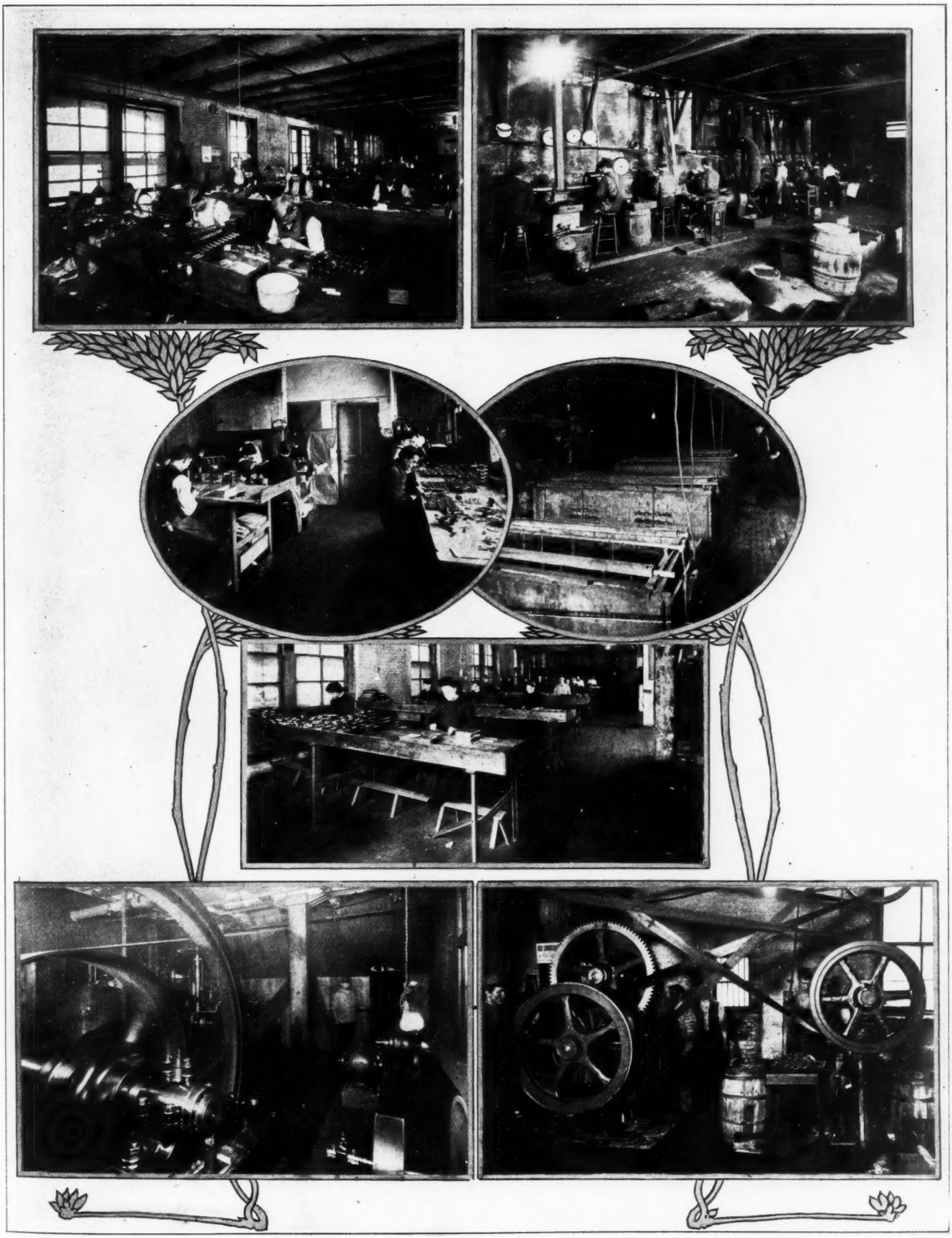
Shipping Department.
Winding Department.



Tool Room.
Section of Telephone Assembling Room.
Screw Machine Department.

General Machine Shop.

Section of Punch Press Department.
Switchboard Department.
Receiver Department.



General Assembling Department. Buffing and Polishing Department.
Transmitter Department. Plating Department.
Engine Room. Section of Telephone Assembling Department. Corner Punch Press Department.

The Swedish-American Telephone Company makes a specialty of manufacturing equipment for small community exchanges, party and rural lines. The demand for their well known Hercules type of bridging telephone is especially heavy. The unusual strength and durability of this instrument appeals to all telephone men and they unhesitatingly pronounce it an ideal telephone for heavily loaded lines and severe service. It is a well known fact that a few years ago the demand for first-class instruments by the Independent telephone companies far exceeded the supply and at the time of the organization of the Swedish-American Telephone Company, Independent exchange owners and managers were demanding better equipment that would successfully meet Bell competition. This the Swedish-American Telephone Company furnished and for the first time in the history of Independent telephony, exchanges were able to secure not only as good, but far superior, equipment to that of the Bell.

This company always endeavors to make apparatus that is extremely simple and of the kind that will operate successfully without requiring much attention. It is a fact well known to exchange managers that the expense of maintaining telephone apparatus is always a very large item; this is especially true on rural lines, where a case of trouble means a long trip and a considerable expenditure of time. The Swedish-American telephone is designed to take care of itself for the most part, and aside from accidental trouble and the replacing of batteries about once a year the instrument very seldom requires any attention. When it is necessary to replace any part, the inspector need not use a soldering outfit or an elaborate kit of tools; all that will be needed is an ordinary screwdriver. The part can be changed without disturbing a single wire. This last quality is much appreciated by those operating farmers' lines, and who have, no doubt, contributed very largely toward making the Swedish-American telephone the most popular for rural lines.

Judging from the prominence of this concern at this time, it is evident that the demand for first-class goods has been fully met. Many of the best customers are the leading railroads of the country, among them the Pennsylvania, Chicago, Burlington & Quincy, and the Wabash. An additional fact which proves that Swedish-American apparatus is of the best quality is that the United States government, after having made exhaustive tests, has pronounced their goods superior to all other telephone apparatus that is manufactured. On the following pages will be shown views of the various sections of their manufacturing plant. It is sufficient to say that there is not another manufacturing concern of any description that is more thoroughly equipped and better managed than the Swedish-American Telephone Company.

All of their apparatus is fully covered by patents, which are owned by the company. The affairs of this concern are in the hands of men of experience, business ability and sagacity. The success of this enterprising concern is largely due to its officers and their able assistants.

Mr. Tiodolf, the general superintendent, has the entire factory under his supervision. He is recognized as one of the leading telephone engineers of the United States, and the successful operation of the factory is almost entirely due to his efforts.

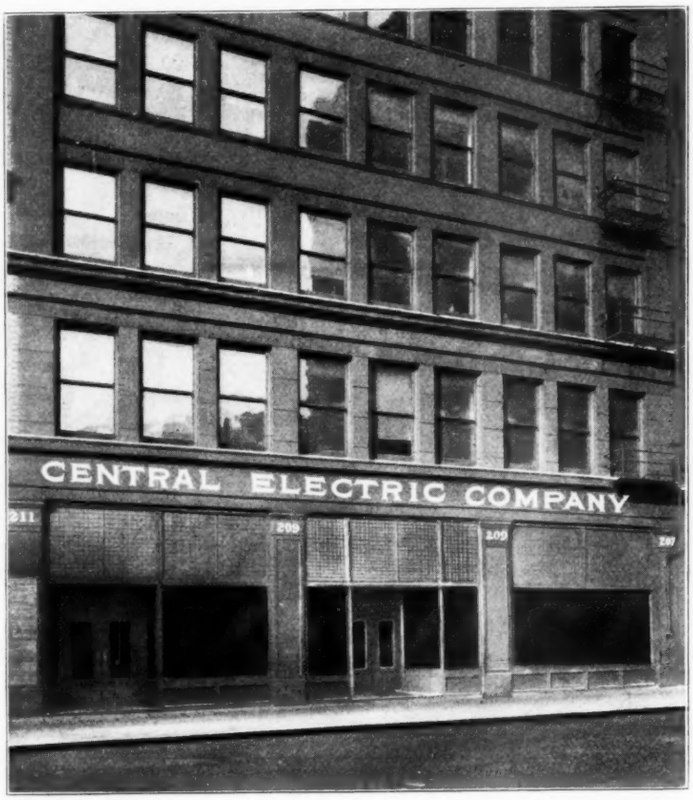
The company employs a large number of traveling salesmen, who are not only salesmen, but men who understand the wants of the purchaser and men who can explain the method of construction and operation of telephone systems to customers who are just starting into the business. A great deal of the popularity of this company is obtained through these salesmen, because they have, under all circumstances, made themselves liked and treated their customers courteously and honorably.

Illustrating the broad field covered by this firm, they have apparatus in all parts of the world. There probably are more "Hercules" telephones used on rural lines than any other three makes, is their claim. Their small exchange equipment is in use in hundreds of town and hamlets, while their large central energy equipment is used in every state in the Union, all giving universal satisfaction.

In conclusion, it is said, and without exaggeration, that the growth and success of the Swedish-American Telephone Company has been greater than any other Independent telephone manufacturing company, considering the length of time in business.

CENTRAL ELECTRIC COMPANY'S NEW CATALOGUE.

The Central Electric Company, 207-211 East Jackson boulevard, Chicago, has issued a new catalogue and price list—No. 23—devoted to telephones, appliances and construction material, which is complete and comprehensive in every particular. On the first page of the book is a



TEMPORARY LOCATION OF CENTRAL ELECTRIC COMPANY.

partial view of the Central company's new headquarters, a cut of which is herewith shown. A complete line of telephones, parts and materials is listed, and the company states that the prices quoted are the lowest in force. The catalogue is attractive, and the company requests that all users of this material who have not received a copy should write for one at once.

The Central company, though in temporary headquarters, is doing a tremendous business and is able to make prompt shipments. A pretentious and handsome new building is being erected on the site of the burned structure on Fifth avenue, and when the Central company again gets settled in its former place of business it will be in better shape than ever to handle the trade of telephone and electrical buyers.

Since the big fire, which completely destroyed the Central's establishment last February, a complete new stock has been installed and telephone buyers may rest assured that

AMERICAN ELECTRICAL SUPPLY COMPANY.

The American Electrical Supply Company, Chicago, while a new house, has attracted considerable attention in the telephone and electrical field, on account of some of the large contracts which it has already secured, and for the amount of business it has transacted in the telephone and telephone supply lines in the short period which it has been in existence. It is safe to say that its stock and shipping departments are among the busiest in Chicago. The company occupies the building at 87 Fifth avenue, where it carries a large and exclusive line of telephones and telephone supplies and electrical material of all kinds. It also has a warehouse at 225 Washington street, and its manufacturing department is located at the same address. Besides having a large and varied line of general supplies and construction material, from which it can make immediate shipments, it is exceptionally fortunate in the many agencies it already has secured, among which are the following:

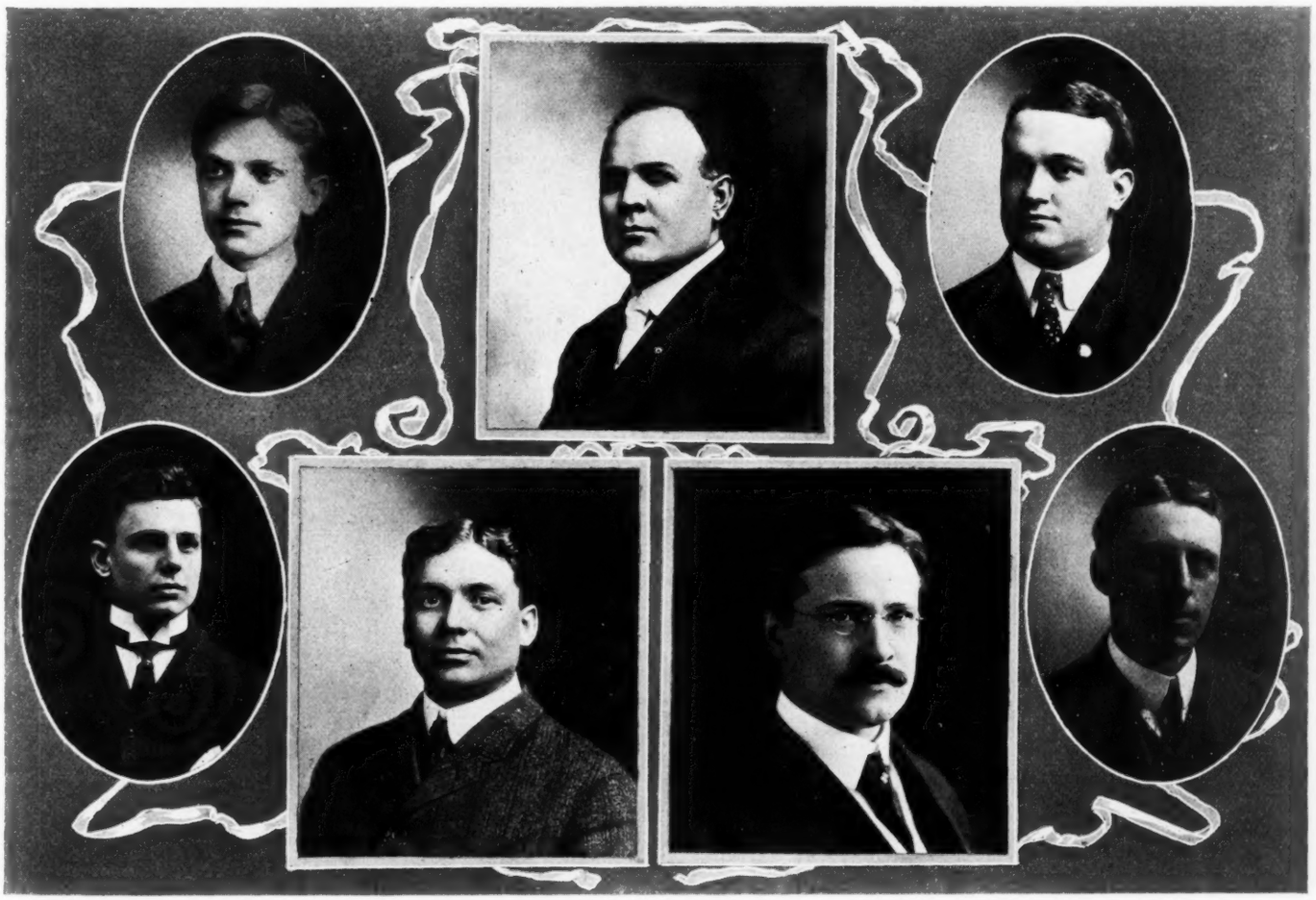
Sumter Telephones and Telephone Accessories.
Mason Multi-Discharge Lightning Arresters.
Bishop Special Telephone Wire.
Blake Insulated Staples.

It is also agent for many other telephone and electrical specialties, carrying a large stock of each and for which it is prepared to make immediate shipments from Chicago.

The manufacturing department of this company, which occupies two large floors, is equipped with new and up-to-date machinery throughout, and is under very competent management, employing only experienced foremen and skilled mechanics. It is to be complimented on the exceptionally fine work it is turning out, which in itself is the best testimonial as to the merits of the American Electrical Supply Company's product.

The officers of this company are men who have had years of experience, who are well and favorably known and of high standing in the electrical and telephone business, and who are bound to bring success to the new house.

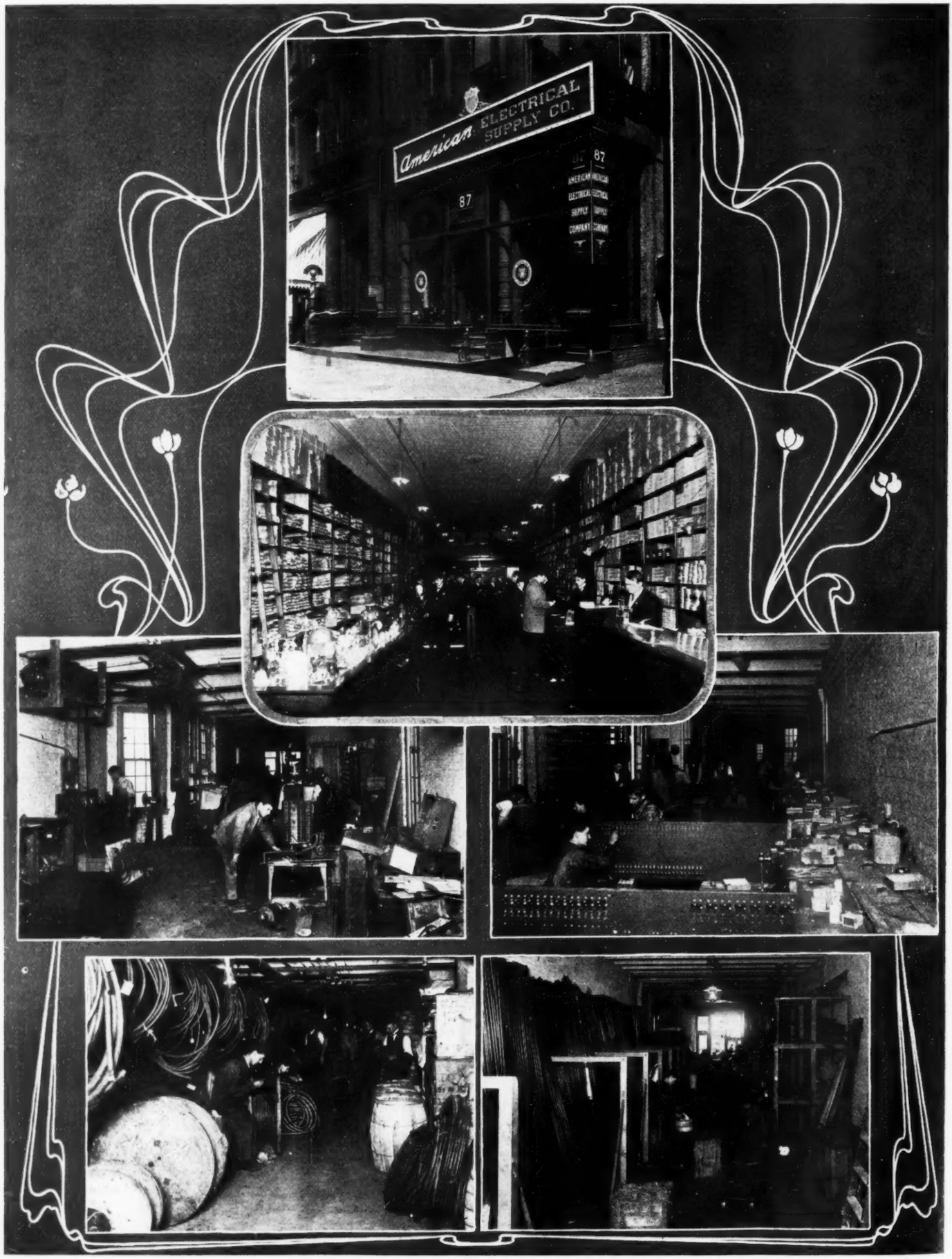
C. Edw. Browne, president, is a man well fitted to be at the head of a new and enterprising concern, such as the American Electrical Supply Company. He has had a wide experience in the telephone and electrical field, and has an enviable reputation among the electrical trade. He was for ten years general superintendent of the David J. Braun Manufacturing Company, and for the past five years he has held the position of secretary and general manager of Henry Newgard & Company, one of Chicago's largest contracting concerns.



B. J. Mockenhaupt, General Sales Manager. C. Edward Brown, President. W. J. Dukes, Manager City Sales.
C. H. Ritter, Purchasing Agent. Charles A. Robinson, Special Salesman.
F. P. Phillips, Vice-President and General Manager. W. H. Gross, Treasurer.

F. D. Phillips, vice-president and general manager, while not having had as many years' experience in the business as Mr. Browne, is nevertheless well known to the electrical fraternity, having been for five years traveling representative of the Electric Appliance Company, and for the past year treasurer and general manager of the Crescent Company. Because of his enterprising, energetic and aggressive methods he is bringing with him a large number of customers. He is well equipped for the position which he holds with the new house, and he will undoubtedly do his part towards bringing success, for no man of his force of character and marked business ability can other than be a highly valuable man to any concern.

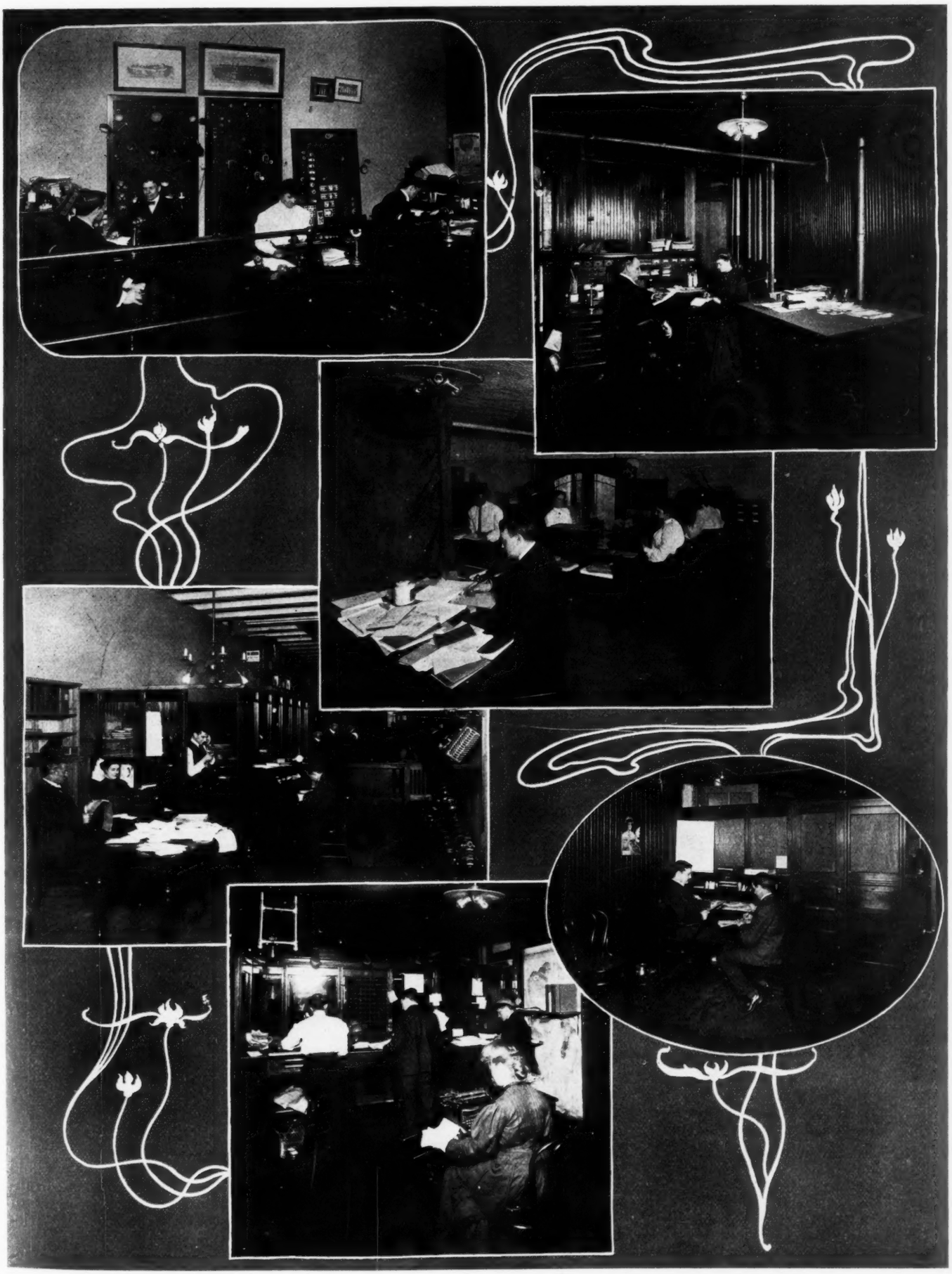
W. H. Gross, treasurer, is eminently qualified to manage



Repair Department.
Cable and Wire Department.

Home of American Electrical Supply Company.
View in Retail Department.

Power Board Assembling Department.
View in Stock Room.



Office of Vice-President and General Manager.

Order Department.

Office of Manager of City Sales.

Accounting Room.

Office of President.

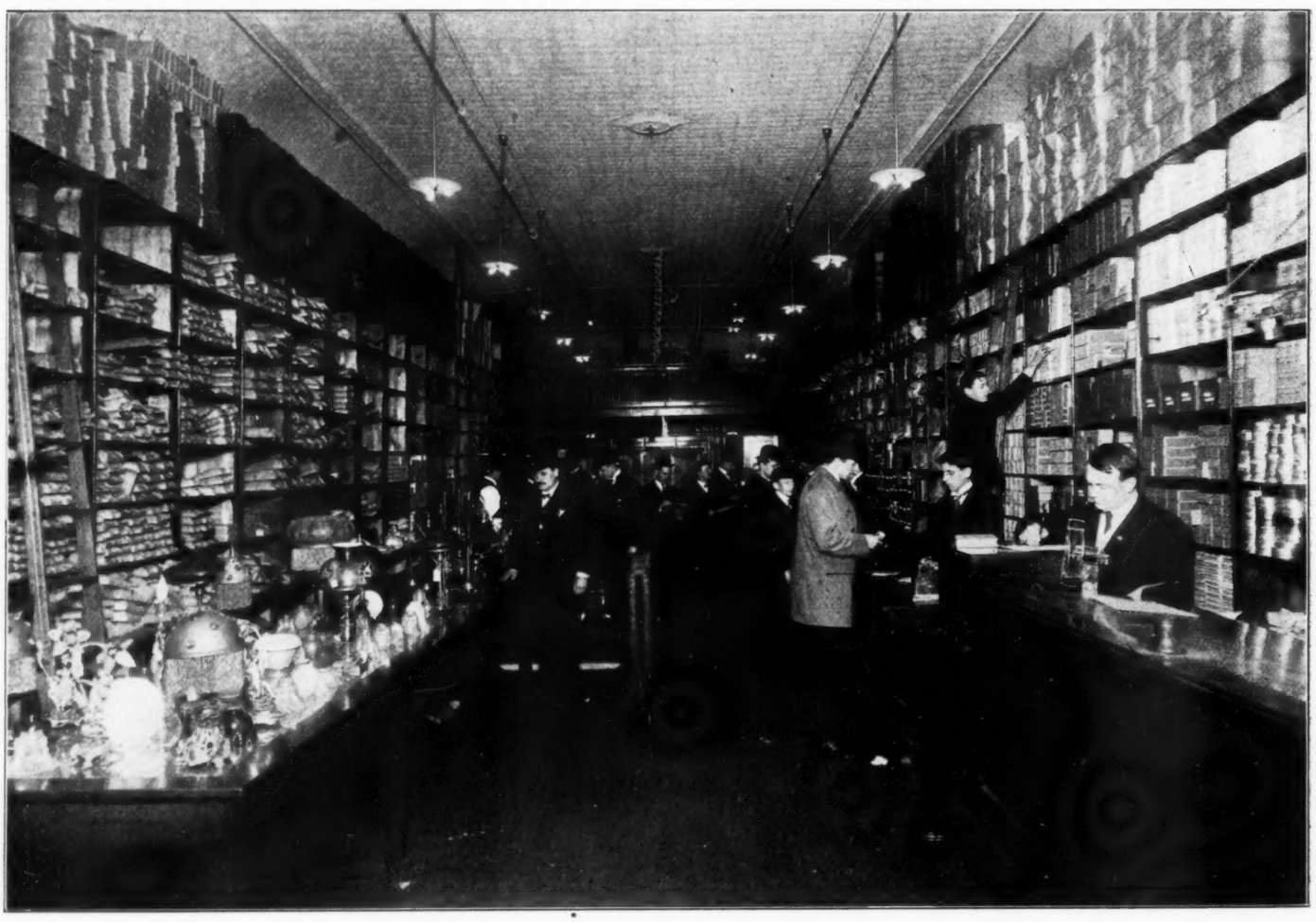
Office of Treasurer.

the financial and auditing departments of a new and growing business, having had four years' experience handling the financial end of the Stephenson Gross Company, of which he was formerly secretary and treasurer. Prior to that, Mr. Gross was for nine years engaged in the banking business, so that the finances of the American Electrical Supply Company are being looked after by a very capable man.

B. J. Mockenhaupt, general sales manager, is well prepared to fill this position, having been connected with the Electric Appliance Company for the past five years, all of that time being employed in the sales department.

W. J. Dukes, manager of the city sales department, formerly filled a like position with the Wesco Supply Company, which firm practically was a pioneer in the electrical business in the United States; later he was in charge of the railway supply department of the Great Western Electric Supply Company, formerly located in Chicago. For the past four years he has been in charge of the city sales of M. B. Austin & Company.

The corps of young men who represent the American Electrical Supply Company upon the road will need no special introduction to the trade. They have been carefully selected to the end that they may carry out the clean-cut and progressive methods which this house has adopted as its business policy. It takes good men to represent a good house. Here is found the happy combination. The wisdom shown by the American Electrical Supply Company



VIEW IN RETAIL DEPARTMENT, AMERICAN ELECTRICAL SUPPLY COMPANY.

pany of St. Louis, and is therefore fully qualified to look after the interests of the new house, and to push its interests in the city field.

C. H. Ritter, purchasing agent, while a young man, is well qualified to fill the position which he holds. He has been connected with the electrical business for several years, and has proven himself to be a very capable man. He was for three years in the supply department of the Western Electric Company, Chicago, leaving that concern to take the position of purchasing agent with the Manhattan Electrical Supply Company, Chicago, and for the past year has filled the same position with Henry Newgard & Company.

Charles A. Robinson, special salesman, has had many years' experience in the telephone and electrical business, and the American Electrical Supply Company is fortunate in securing as competent a man as Mr. Robinson to look after its large deals. Mr. Robinson's experience dates back to the old days of the Sprague Electric Equipment Company, which firm practically was a pioneer in the electrical business in the United States; later he was in charge of the railway supply department of the Great Western Electric Supply Company, formerly located in Chicago. For the past four years he has been in charge of the city sales of M. B. Austin & Company.

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The house is especially well prepared to take care of the telephone end of the supply business, and is not making a side issue of it, as is often the case with electrical supply houses.

INDEPENDENT TELEPHONES GO TO GREECE.

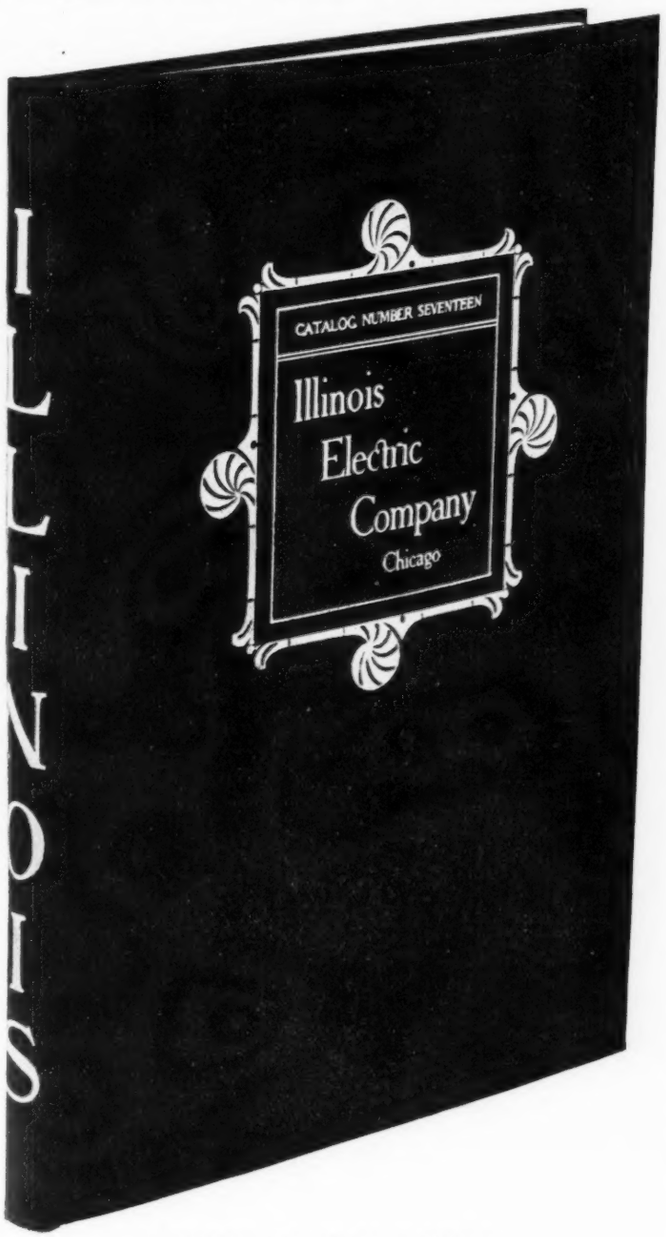
While there are many European telephone manufacturers who, by reason of their cheap labor, it would seem, could always hold the trade in their own countries, yet it is rapidly being shown that the Independent manufacturers of the United States will eventually lead the world in the telephone industry.

The keen competition between the different manufacturers in this country has resulted in the production of much simpler and far more durable systems than those

made in foreign countries, which places our manufacturers in a position where they can successfully compete with foreign manufacturers, when quality of system is considered. Among the recent foreign contracts placed in this country is an order for a complete central energy telephone equipment for the railway system at Athens, Greece. Apostolos Agathocles, engineer of the railway company, after a thorough personal investigation of all the leading telephone systems in Europe and this country, placed the contract with the International Telephone Manufacturing Company of Chicago before returning to his home.

ILLINOIS ELECTRIC COMPANY'S NEW CATALOGUE.

In the line of catalogues, the one just issued by the Illinois Electric Company of Chicago—Catalogue No. 17—is complete in every way, and is in reality a handsome



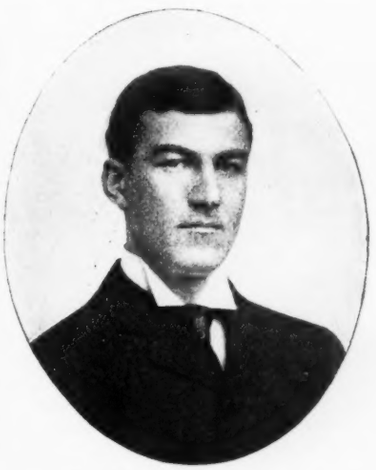
CATALOGUE NO. 17 AS IT LOOKS.

book. It contains 214 pages and hundreds of illustrations, all descriptive of high-grade telephone construction material and specialties—in the words of the company, "material of unquestionable merit which we can honestly recommend." The book is bound in green cloth, which gives it a handsome appearance. Accompanying the catalogue is a complimentary order-book, envelopes, net price list and discount sheet. Every telephone man should have No. 17 on his desk; it will prove more than once a friend in time of need.

A NEW COOKITE.

James Strasburg, whose handsome physiognomy is attached to this short sketch, has recently severed his connection with the Automatic Electric Company of Chicago, and has accepted a position with the sales department of Frank B. Cook, the well-known manufacturer of protective apparatus.

Mr. Strasburg states that he was born at the early age of twelve, and of rich but honest parents. Being born wise, he needed little education, but he agreed to go to the Chicago schools for several years, and afterward entrusted his later training and polishing off to the University of Michigan.



JAMES STRASBURG.

He was connected with the Automatic Electric Company for about three years, and was engaged in installing a number of plants for them. During last summer he was in charge of their exhibit at the World's Fair in St. Louis, in which connection he will probably be remembered by many who visited the Automatic booth in the Electricity building.

Mr. Strasburg is reported to be a keen humorist, and it is said that his conversation abounds with many merry quips and spontaneous bursts of scintillating wit. His training and experience as a practical telephone man fit him for the new work which he has taken up, and he will probably make many friends both for himself and for Mr. Cook, in his wanderings over the country.

ALL ABOUT "ANCHORS THAT HOLD."

"Anchors That Hold" is the title of a beautiful new booklet just issued by W. N. Matthews & Brother, 226 North Second street, St. Louis. It tells interestingly and convincingly of the many ways that money can be saved by using the Stombaugh guy anchor.

First comes their trial order proposition, then an account of tests made by Prof. R. C. Carpenter of Cornell University, then recommendations and tables showing holding powers. A series of photographs explains clearly the correct method of anchoring a pole in twenty minutes, to stand a strain of 15,000 pounds. After this there are twenty or more testimonial letters from all over the country and handsomely illustrated with half-tone cuts. The last page contains a list of fifty-seven Independent telephone companies that are using Stombaugh guy anchors. The booklet may be had for the asking.

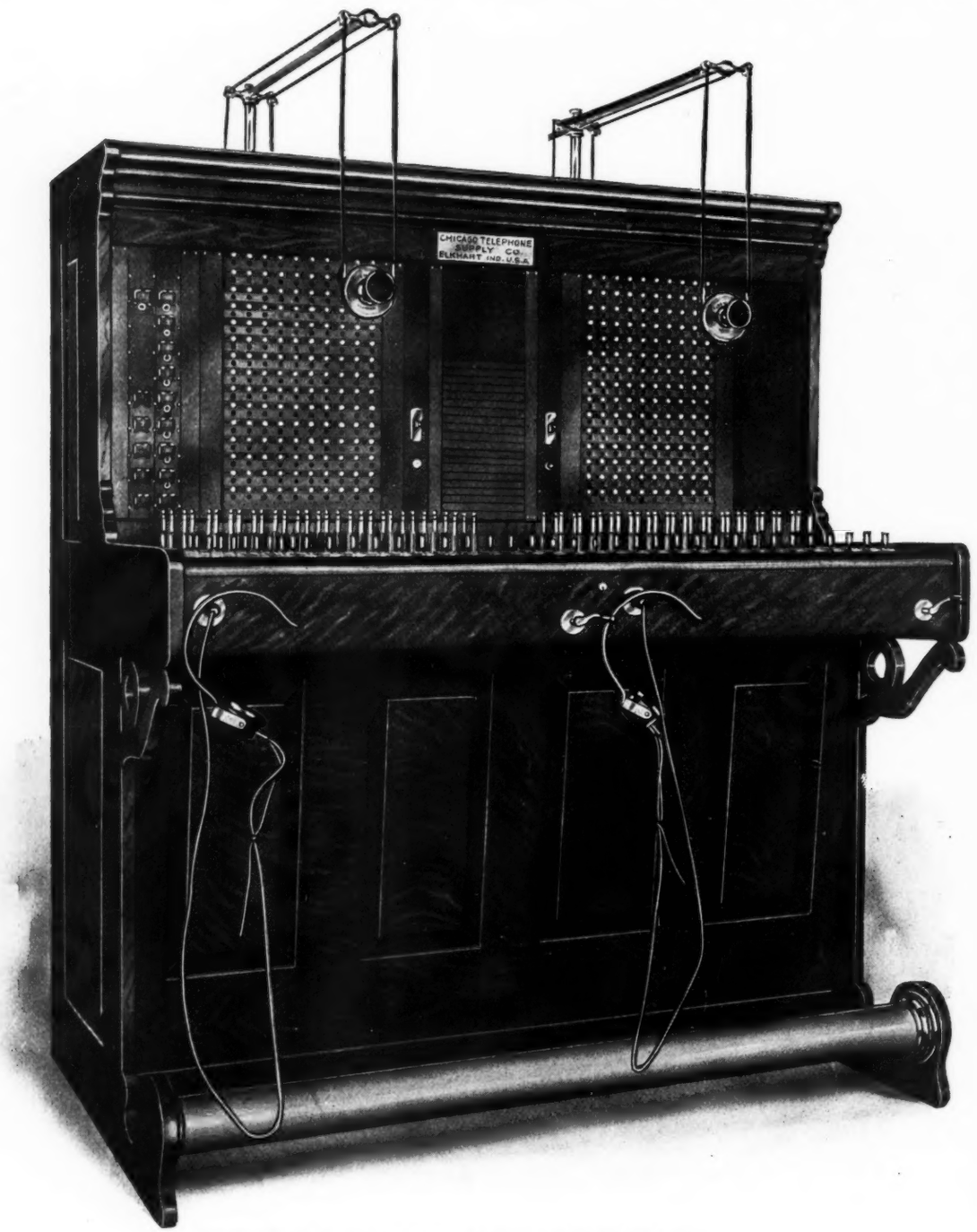
W. N. Matthews & Brother have recently moved their offices and warerooms to 226 North Second street, St. Louis, where they occupy the entire building, which has four stories and a basement. They state that they are carrying a larger stock of anchors than ever and can therefore give their customers west of the Mississippi quicker shipments than ever. All shipments east of the Mississippi are shipped from Chicago, Sidney, Ohio, or New York city.

EL PASO TELEPHONE COMPANY AND ITS EQUIPMENT.

M. H. Spere of Nebraska obtained a franchise for a telephone exchange at Colorado City, Colorado. While in itself the obtaining of a franchise for an exchange of this kind is nothing unusual, yet upon investigation it is found that this is one of the first franchises of any importance granted to a bona fide Independent telephone investor in this territory.

The state of Colorado heretofore has been the Bell company's exclusive territory. As the establishment of an exchange of this size in Colorado would simply be the entering wedge for Independent telephone companies in this splendid territory, it was, of course, highly desirable that Mr. Spere should obtain and install first-class equipment. The question of cost and the economical phase of the question were really a secondary consideration so long as good, sound business judgment was used in the selection of the material and the properly equipped construction of the telephone system.

After a painstaking and careful investigation on the part of the new company at Colorado City, it was decided to place the order for the full equipment of apparatus with the Chicago Telephone Supply Company of Elkhart, Indiana. It was decided to adopt the full common battery system. The fullest opportunity for investigation was afforded Mr. Spere by the inspection of the Home Telephone Company of South Bend, Indiana, the Home Telephone Company of Goshen, Indiana, and the Home Telephone Company of Elkhart, Indiana, whose exchanges are equipped throughout with the Chicago Telephone Supply



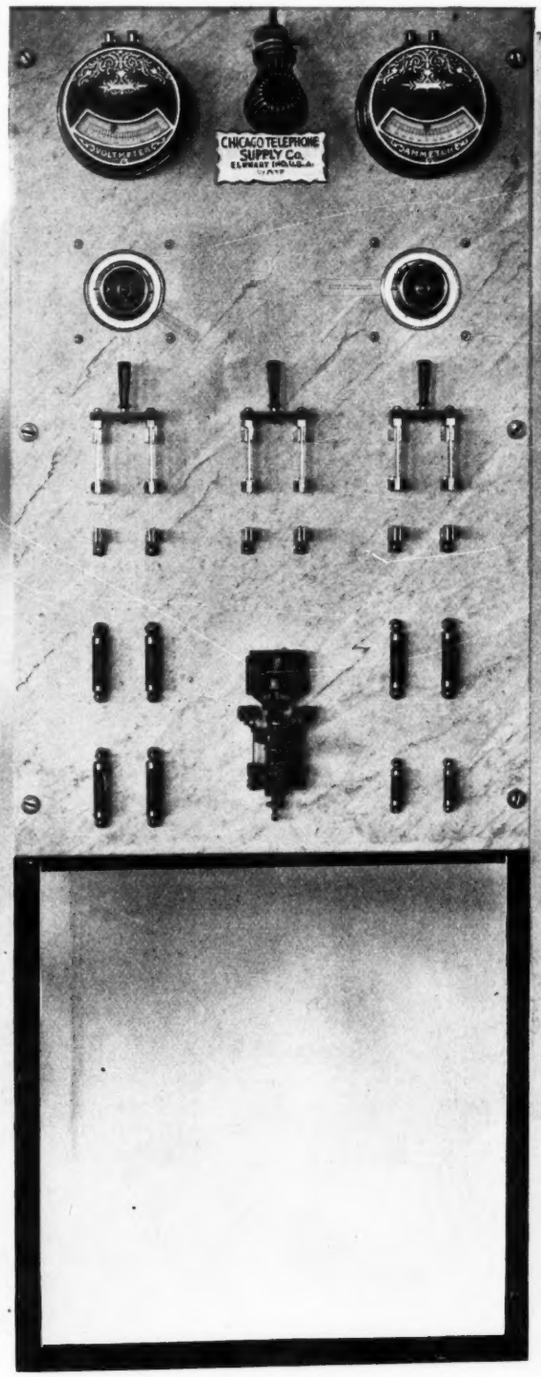
TWO-POSITION CHICAGO EXPRESS SWITCHBOARD.

Company's well-known and up-to-date telephone apparatus.

The following brief description will clearly outline this modern equipment in full detail:

The switchboard proper consists of one large standard cabinet, quarter-sawed oak, highly finished, equipped with two operator's positions. The signals are of the well-known lamp type. There are 150 lamp and line jacks mounted in strips of ten, with inch centers, to each operator's position. To each operator's position are installed fifteen complete cord equipments of the double lamp supervisory type; each equipment is provided with Code No. 310 keys, full platinum pointed. In addition to these keys, there are furnished with each operator's position two order wire keys, one night alarm switching key, one hand and power generator, and one operator's key, for connecting both operator's sets together. Each operator's set is provided with the usual operator's equipment—head receiver, cord and plug and solid back transmitter, suspended from a highly finished, nickel-plated adjustable transmitter arm.

In addition to the common battery equipment in this switchboard there is provided a full equipment for handling long-distance generator call lines. Ten high wound drops, furnished with jacks, are mounted on the left-hand side of the first operator's position. These are of the well-known Chicago Express type, and the first five cord equipments in the first operator's position on the left-hand side are equipped with the special repeating coil keys, Code No. 312. The operator can, at will, move these keys from common battery to magneto, thus enabling her to put up all connections, both from the local lines to the long-distance lines, and vice versa.



POWER BOARD.

The wiring of this switchboard has been done in the most thorough and workmanlike manner. Only the best material has been used throughout. All insulations are of pure rubber, and all contacts are platinum pointed. The cabling of the board has been made up according to standard practice, with No. 4 tinned copper wire, one silk and one cotton, with beeswax finish. Each circuit terminates on connecting bars on well-filled maple mounting strip, mounted on iron relay frame. From there it is fused to the battery bus-bars. The circuits are brought to this switchboard and distributed to very heavy and large ampere bus-bars, which gives the maximum output of the batteries, and completely does away with any self-induction. Boards of this character are absolutely free from any cross talk.

All the supervisory and pilot relays are mounted on an iron frame, shown in the back of the switchboard. This frame is self-contained and rigid, and securely fastened together, first heavily copper plated, and then given a dull, lacquered finish. This finish simply illustrates the care with which each detail in this board has been worked out, and the care taken to make a perfect article in every respect, making it impossible for this iron work to rust or deteriorate for years.

There are only two relays to each cord circuit. These are of the well-known Chicago Code No. 292 type, platinum pointed, provided with screw dustproof caps. These relays are all securely fastened by lock nuts to the mounting strip, which are, in turn, fastened to the frame.

Two condensers are used to each cord circuit. These are of the 2 M. F. type, and are all mounted in the top of the switchboard—a very secure manner. The shells of the condensers are all carefully insulated from each other, and are held in place by angle iron mountings. Special attention has been given to all joints in this switchboard. Each and every joint has been carefully soldered with a non-corrosive solder solution.

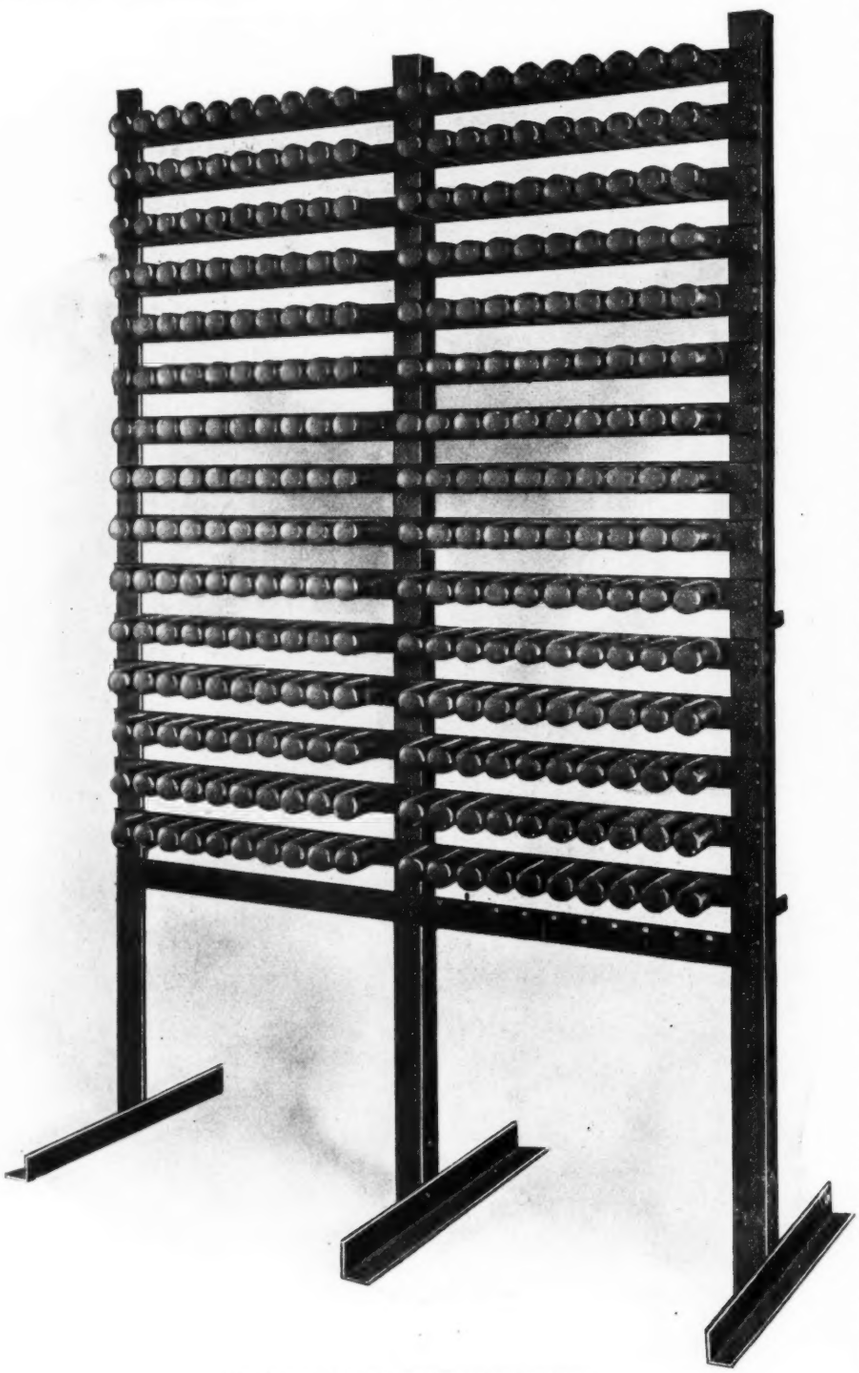
The switchboard cable to the line relay rack and distributing board is the universal standard code, fifty-pair, switchboard cable. The battery is fed to the lines at the relay rack. Half of the cables go to the clips on the distributing board, and the other half go to the relays on the line relay rack.

The power plant consists of a complete equipment of one handsome slab of Italian marble, mounted upon heavily japanned iron framework. Upon this slab is mounted a very complete equipment of testing instruments, switches and circuits—one Weston voltmeter, one Weston ammeter, two rotary switches, one extra heavy double pole double

throw main line switch, one I. T. E. single overload and underload circuit breaker. All the circuits are properly fused with enclosed D. &. W. fuses. The board is correctly wired in the back with heavy bus-bars and terminals. Mounted on the board is one handsome, ornamental bracket, with porcelain half shade, with one 110-volt lamp. All the circuits terminate upon this board. All the necessary switching is done by the heavy knife switches.

One complete equipment of storage batteries, type J3, with capacity of 500 watts; one battery generator, with complete equipment of dry batteries, capable of delivering seventy-five volts of alternating current, are used. This instrument is wired to panel board to fuses and from there to the switchboard proper. The battery generator is equipped with north and south pulsating current to be used for selective ringing. The direct current necessary for the charging of the storage batteries is furnished by one type P. L. dynamo. The secondary side of this dynamo is wound to furnish 600 watts of direct current; the primary side of the dynamo is wound to operate on 550 volts of direct current from the electric light mains. This side of the machine is furnished with a rheostat, or controller, which correctly regulates the charging of the batteries, and also the speed of the motor part of the machine.

A 600-line capacity Chicago iron frame distributing board, with self-soldering heat coils, has been furnished. This is a very handsome board in appearance, and highly efficient. The self-soldering heat coils are very reliable and positive in action. The clips and mountings are of the best character of material and workmanship; the iron frame itself is securely bolted together and highly finished with black enamel. The switchboard terminals are mounted in pure rubber strips, and these strips in turn are mounted upon a well-filled hard maple panel, neatly drilled and numbered.



IRON FRAME DISTRIBUTING BOARD.

A full equipment of telephones has been furnished with the switchboard, consisting of a large number of Chicago common battery wall telephones, Code No. 95. These instruments are very fine in general appearance, and each and every part is of the very best material and workmanship. The talking qualities of the instruments are very high, and perfect transmission can be obtained under severe and trying conditions. The hotel set, Code No. 98, is used largely in this installation for resident subscribers.

Where a portable telephone has been required, the new desk set, Code No. 97, has been furnished. This is one of the finest desk sets upon the market. The handle is quite a novelty in itself, being made of pure hard rubber, and finished with a pistol grip. In addition to this, it presents a very pleasing appearance, as all the curves of the desk set are symmetrical. The structural points of this instrument cannot be surpassed. The inside of the instrument has been given the closest attention. Each and every part is rigidly in its place, and the springs in the hook are of reliable type, having been well tried in other forms of instruments. It is needless to say that all contacts are platinum pointed, and that the springs are of pure German silver. The entire outer part of the desk set can be removed from the structural frame of the instrument by unscrewing one main line screw. In this way it does away with the injuring of cords, which has been so common in the past with the novelty desk sets on the market.

The cord terminals on this desk set are of new and improved character. They are made so that they easily accommodate two terminals. The bell itself is of the most substantial make, provided with a two-microfarad condenser, and a 1,000-ohm ringer.

It is predicted that the end of 1905 will see 5,000,000 Independent telephones in use.

ALUMINUM RELAY SHELLS.

More than any other one reason, perhaps, automatic methods are responsible for the low prices at which telephone apparatus and kindred product can be purchased at the present time. Anything new in this respect is eagerly inspected by telephone men. Now comes the Stromberg-Carlson Telephone Manufacturing Company of Rochester, New York, with the idea of equipping its relays with aluminum shells.

In the manufacturing process a sheet of aluminum is placed in the punch press and the first operation stamps or cuts a piece of the metal of the required size. Another die contained within this first drops down and forces this piece of metal into the shape shown in Fig. 1. The second draw forms the shape shown in Fig. 2. The third results in the shape shown in Fig. 3. Three operations complete the drawing of the shell from the raw material. The shell complete shown in Fig. 4 is the company's No. 6 relay shell and weighs 3¼ ounces. A duplicate of this in steel or iron, known as the No. 2, weighs 8½ ounces, making a difference in weight in favor of the aluminum of 5¼ ounces. The difference in weight on a 3,000-line switchboard amounts to over half a ton. This applies only to the relays mounted on the relay rack. No attempt has been made to figure the weight saved by the use of this shell throughout a switchboard.

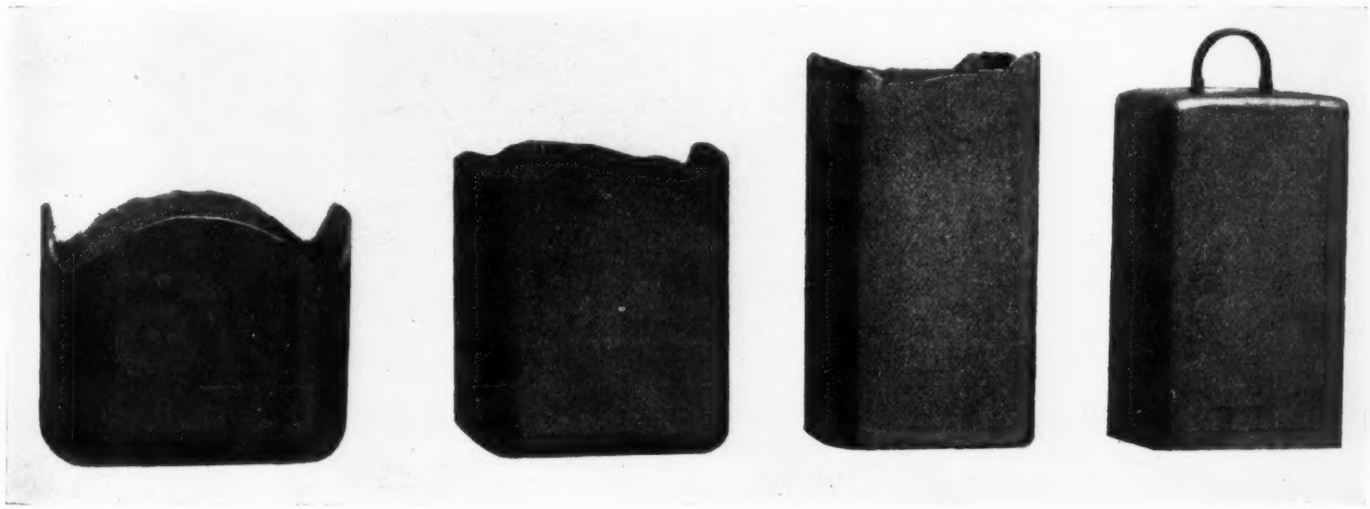


FIG. 1. FIG. 2. FIG. 3. FIG. 4

On a 3,000-line relay switchboard, some of the positions have only a few cord pairs, while others have as many as space will permit. Taking the general average, it may be said that in a 3,000-line switchboard, there will be a total saving in weight of at least 2,500 pounds. The relays of the cord circuits are mounted in groups and covered with a shell, known as the No. 7. The cost of aluminum is greater than that of drawn steel. Aluminum is, however, so much lighter that the cost of the finished article is about the same. The purchaser, while not paying more for the aluminum, gets something far better than steel, inasmuch as aluminum is lighter in weight and not being japanned, cannot get scratched or marred by use.

THE C. C. C. PRIZE CONTEST.

In this issue of TELEPHONY somewhere among the advertisements will be found a trade mark. Whose trade mark is it? To the first five answering correctly, the firm it belongs to will give a first prize of one pair of Donnelly Eastern climbers, handsomely nickel-plated, with straps complete; second prize, pair of Fry's patent telegraph pliers nicely plated; third prize, one pair of 5½-inch Bernard's cutting pliers; fourth prize, one pair of 10-inch splicing clamps nickel-plated; fifth prize, one pair of electrician's scissors for cutting wire, sheet metal, etc.

In order to give everybody a fair and equal chance to win one of these prizes the following conditions will govern the contest:

All answers are to be addressed as follows: "Trade Mark Contest, care of TELEPHONY, 301 Manhattan Building, Chicago, Illinois.

Answers as soon as received will be deposited in a locked box with no opening save the slot to receive the envelopes. At 4:30 p. m., June 15, 1905, when the contest will close, this slot will be sealed and the box shipped to the home office of the firm conducting the contest. It will be thoroughly shaken in the presence of a committee appointed for the purpose and the manager of the local Independent telephone exchange, as a representative of the interests of those submitting answers, will be blindfolded, the box unlocked and he will take therefrom envelopes from different parts of the box. These will be opened in the order they are drawn out. The first correct answer will be numbered 1, the second 2, etc., and the prizes will then be sent, charges prepaid to the nearest railroad station, to the lucky winners.

The committee will then make affidavit before a properly authorized state notary public that the contest has been conducted strictly according to the above conditions, and the full affidavit with the names of the winners will be published in the July number of TELEPHONY.

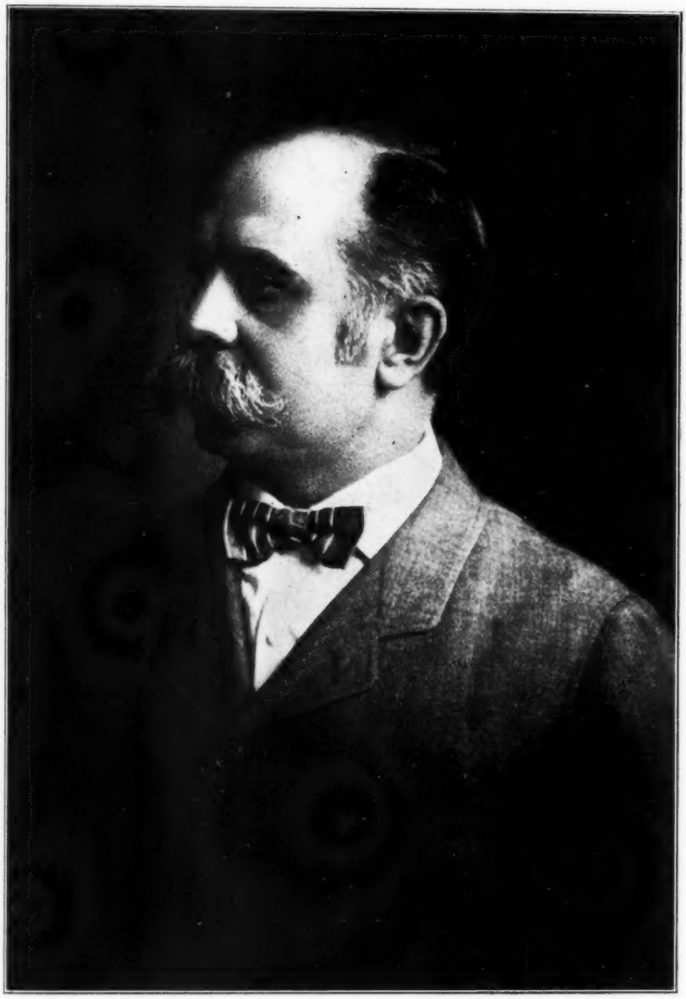
AN ARTISTIC LITTLE BOOKLET.

The Rolfe Electric Company, Rochester, New York, describes its product in a handsome little red-and-gold booklet, which this concern is mailing to the trade. There are numerous illustrations and descriptions of bells, buzzers, fuse boxes, etc., accompanied by flattering testimonials from many who have used the Rolfe apparatus. Half of the booklet is given over to "Electrical Laws and Rules of Practice," from the publication, "Modern Light and Heat," which consists of simple definitions and formulæ for unprofessional readers. A fine picture of Charles A. Rolfe also adorns the work. This booklet will be sent to any electrician or telephone man asking for same.

MILO G. KELLOGG'S PRESENT PLANS AND WORK.

During the past year an experimental shop, equipped with the newest and highest grade of machinery, has been in operation on the third floor of the Electrical Building on Jackson boulevard, in Chicago, under the management of one of the best electrical machinists and designers of telephone apparatus in the country, employing about a dozen selected mechanics who have previously been employed in various telephone factories in Chicago. The character and scope of their work has been somewhat of a mystery, but it has been generally understood and believed that they have been working for, or in the interest of, Milo G. Kellogg and in furtherance of a general plan of his to reinstate himself in the telephone manufacturing business, from which he was dispossessed when his attorney sold out the control of the Kellogg Switchboard & Supply Company to the Bell telephone interests at a time when he himself was desperately ill in California and it was not expected that he would recover his health—at least, sufficiently to take up active work again.

During the last year, also, some of the foremost telephone engineers, inventors and patent experts, whom Mr. Kellogg had had in his employ in the Kellogg company, and a few other telephone engineers and inventors have been known to be quietly, but industriously, at work in offices in the Association building in Chicago. The character and scope of their work also has been unknown, but it was generally understood or believed that they also were working for, or in, Mr. Kellogg's interests in furtherance of the same object. Mr. Kellogg has heretofore declined to make any general statement as to his plans and objects, and those who have thus been supposed to be in his employ have declined to give positive information as to the character of their work, and the whole undertaking has been the subject of considerable surmise. Mr. Kellogg has now consented to give out some statement as to what his plans and objects are in the establishment and maintenance of this engineering and inventing corps and experimental shop.



MILO G. KELLOGG.

When Mr. Kellogg learned of the sale of his stock six months after it had occurred, and when he had become convalescent, he determined to take every step within his power to regain the control of his company and thereby be in a position to carry out to the end his plans for which he had worked for many years, and thus meet the expectations of his customers in the Independent telephone field. He believed at first that under the changed condition of his recovery, the Bell interests could be made to see it to their advantage to surrender the control of the Kellogg company quietly and without recourse to litigation, and he at first adopted the course of negotiation to obtain the recovery of his stock. These negotiations were carried on for some time with apparently good prospects of success. When they finally failed, he adopted the alternate course which he had had in mind from the start—that of endeavoring to recover his stock and the control of his company by litigation. He knew that within a few months after the Bell interests had obtained control of his company, its engineering and inventive corps had been so disorganized and disrupted that the company was making practically no advancement in the art, and he believed that it would not do so during the course of the litigation, which could be, and he thought was liable to be, protracted. He did not wish, when he had obtained back the company, as he had strong hopes of doing by means of the litigation, to have it a company which had lost years in the progress of development, but he wished to be in a position at that time so that he could put his company at the very front as far as advance in the art was concerned, and put it in a position to furnish apparatus to its customers which should be superior to the apparatus which was then being furnished to the Bell licensee companies, as the apparatus which it was turning out in the years 1901 and 1902 had been.

To that end and with that object in view, as soon as he filed his bill for the recovery of his stock, which was in November, 1903, he began the employment of electrical engineers and inventors on his own account to carry on lines of development and improvement in telephone apparatus and systems, such as had been carried on during his control of the Kellogg company; and in 1904 he established his experimental shop to put into concrete commercial form the improvements in apparatus and systems which his engineering and inventing corps had devised and were devising.

While Mr. Kellogg, as stated above, has very strong grounds for expecting a favorable conclusion of his suit, and is advised to that effect by his attorneys, who are among the foremost lawyers in Chicago, he realizes that the law, like medicine and other professions, is not a positive science and that the outcome of the litigation may perhaps be contrary to his expectations. Should this result, he expects by that time to have a full line of the highest form of telephone apparatus devised and ready to place on the market, of kinds which are free from the patent claims of all others, so that he will still be in a position to serve the Independent telephone field in the future, substantially as he has been able to do in the past. At the present time, however, he does not plan to enter the manufacturing field in advance of the final decision in the litigation, or at least, until there are further developments in the suit. This conclusion,

however, is not considered by him as final. Circumstances may cause him to change his plans.

Mr. Kellogg does not consider it to be good business policy on his part to state exactly on what particular lines of telephone development and improvement he is now working, or what are the results of the same. He, however, says that the results, which he has obtained, are beyond his expectations, and he is confident that when they are known and his improved apparatus and systems are placed on the market, it will be recognized that they are considerably superior to the apparatus and systems which are being furnished to Bell exchanges. He says, however, that, generally speaking, his efforts to the present time have been directed especially to multiple switchboards, semi-automatic switchboard systems, full automatic switchboard systems and long-distance transmission, and that in each of these departments he considers that he has made considerable advance in the state of the art, as it exists in the telephone apparatus which is now being put into service. This policy is now, as it was in the past, not to have iron-clad views as to what his customers *ought* to use in their telephone properties and be prepared to furnish only such apparatus, but rather to be in a position to furnish the best quality of apparatus of whatever general character different Independent companies may consider as best adapted to their particular requirements.

The case will be heard, on oral argument, by the Appellate court of the First District of Illinois, at Chicago, early in June, and its decision is expected during the summer. It is expected, whatever the decision of the Appellate court may be, that an appeal will be taken to the Supreme court of Illinois, and on the Supreme court will rest the final determination of the case. Such a decision may be rendered by the end of the year. From the attitude of the Supreme court heretofore on cognate questions and the similarity of this case to other cases which it has decided, and the soundness of his contentions, Mr. Kellogg bases his confidence in the ultimate decision of the case in his favor, whatever may be the judgments of the lower courts.

MILO G. KELLOGG'S EXPERIMENTAL ENGINEERING AND INVENTING CORPS.

NEW DEAN CONTRACTS.

The Niagara Home Telephone Company of Niagara Falls, New York, recently closed a contract with the Dean Electric Company of Elyria, Ohio, for a complete new exchange equipment, consisting of a common battery multiple switchboard of 3,000 ultimate capacity, with a present equipment for 860 local lines and twenty magneto lines. A two-position combined monitor's and chief operator's desk and a wire chief's desk are also included in this contract. The switchboard is to be equipped with the Dean harmonic system for four-party selective ringing, each cord circuit having a four-button indicating ringing key for this purpose. Heretofore it has been absolutely impossible to employ a four-party selective system at Niagara Falls, due to the necessary grounds on such systems at the subscribers' stations, these grounds unbalancing the line so as to be influenced by the numerous high tension transmission lines with which the city abounds, thereby making the talking circuits too noisy for use.

This party line equipment gives the Home company a big advantage over the local Bell company, as the only party line system available for the latter's use employs grounds at the subscribers' stations, which in this locality would be ruinous to the service.

The Niagara Home Telephone Company is constructing an exchange building for this new equipment and intends to otherwise make the system a model one, so as to show the

many visitors who come from all over the world to see the Falls an up-to-date Independent system.

The Dean Electric Company has also closed a contract with the Dunkirk Home Telephone Company of Dunkirk, New York, for a complete exchange equipment, consisting of a common battery multiple switchboard of 1,500 lines ultimate capacity, equipped for 640 local lines and twenty magneto lines. This equipment is to include the new Dean bridging four-party selective system and will have individual indicating and ringing keys in each cord circuit, thereby facilitating the operation. The party line equipment gives a possible capacity of from 3,000 to 4,000 subscribers' instruments, and a present possible equipment of from 1,300 to 1,700 subscribers. The operation of the switchboard with these extra party line subscribers is made so that the operators can handle the increased number without being overworked. The saving in first cost of equipment and operating is thus made very great and is one of the numerous advantages claimed for the new Dean switchboards and party line equipments.

The Dean company is installing its new four-party selective system on the common battery multiple switchboards of the Albany Home Telephone Company of Albany, New York, and the Cohoes and Waterford Telephone Company of Cohoes, New York. The orders for these equipments include duplicate sets of four frequency ringing machines and complete new key shelves equipped with the Dean four-button indicating ringing and combined listening keys. These key shelves are standard Dean construction and are made with a complete metal framework so that all parts are attached by machine screws, even to the hinges. The woodwork surrounding the keys is attached to the metal, thereby obviating the chances for splitting or warping as in the ordinary construction.

WESTERN ELECTRICAL COMPANY.

Some men's names are often read in print, though they have done little to justify such, while the names of other men who live lives of manifest usefulness and activity, which constitute examples well worth following, are never mentioned. To this latter class, it is safe to say, belongs, among others, the man whose likeness appears in the accompanying cut—G. W. Johnston, founder and general manager of the Western Electrical Company of Omaha, Nebraska.

At the age of fourteen Mr. Johnston started his life of business activity in Detroit, Michigan, where he was born and raised, and though he has not yet reached the age of 40, he ranks to-day as one of the best known men among electrical supply dealers in this country. Starting in the electrical business as an office boy he was, in reward of his hard work and constant application to business, gradually promoted to clerk, traveling salesman, and traveling auditor for one of the largest electrical supply houses in the country. In 1892 he was sent by his company to wind up the affairs of its Omaha branch, the Western Electrical Supply Company, which was about to follow the steps of the Midland Electrical Company, its predecessor, which failed in 1888.

With the keen intellect and quick grasp of the situation, which has been the foundation of his success, he soon saw that Omaha was an ideal location for an electrical supply house, if conducted on a proper business basis. Instead of selling out the stock he bought it and severed his connection with his former employer, in spite of all inducements to the contrary. His high salary and all promises of making the compensation for his valuable services still higher had no attraction to Mr. Johnston, when he saw that he could serve a better purpose for the industrial field at large, as well as for himself, by going into business for himself.

There are but few men who are as well fitted for and bound to make a success of an establishment of their own as Mr. Johnston, as he possesses all the essential qualifications of a manager, such as business acumen, promptness in all transactions, acquisition of the confidence of all with whom he deals, and a credit A-1. Hence he laid then and there the solid foundation upon which the Western Electrical Company of Omaha has been able to grow to be one of the leading electrical supply houses of the middle west, a benefit to the electrical trade of its territory and a pride to its founder. It was not always a bed of roses, but Mr. Johnston was able to put his shoulder to the wheel and push it over obstacles that to most men would have seemed unsurmountable, with only the one object in view: "I will; I must."

There are several secrets of this man's success: First, an unfailing memory; second, his pet motto, which is displayed all over his place of business in print, "Do it now"; third, his ability to employ and associate with him men of professional knowledge and ability to carry out his orders in every detail. His first and only aim in business is his customers' welfare, and to carry out every business obligation he or his company assumes, whether such can be done at a profit or whether it necessitates pecuniary or other losses. "My word must be made good" has sounded into the ears of many an employe of the Western Electrical Company from the manager's mouth, and it is "made good" no matter what the sacrifice.

G. W. JOHNSTON.

Another secret of Mr. Johnston's success is his high regard for a perfect system that binds all the small details of a large business into a perfect whole. He has a system for filing catalogues and like information so arranged that he can lay his hands on any item, no matter how small, in the shortest possible time and with the least amount of labor. The same refers to books, quotations, orders, letters mailed and received, shipments, etc. His punctuality in agreements and payments is still another reason for Mr. Johnston's success; his word is by all that know him considered as good as his note. "I would rather pay bills than eat" is a statement of his that he has certainly proven correct.

His accurate and complete system of bookkeeping was tested in a competent manner shortly after January 4, 1901, when the Western Electrical Company was burned out, the fire starting in an adjoining printing office. The insurance adjusters, who are generally experts on bookkeeping, paid

Mr. Johnston the greatest compliments on his bookkeeping and system, which was so complete and practically arranged that the loss, though almost total, was adjusted in a few hours.

Though this fire came like a thunderbolt from a clear sky and seemed destined to undo in a few minutes what it had taken years of hard work to build up, it affected Mr. Johnston differently from the ordinary individual. He seemed to look at it as simply another test to show his mettle; with a bulldog tenacity and a sacrifice of both comfort and pleasure he stuck to it, and from the ashes of the past he wrought the triumph of the present.

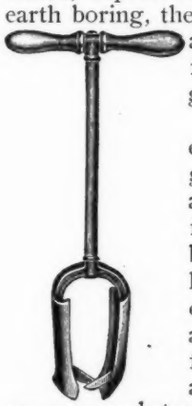
As an individual Mr. Johnston is as remarkable as he is as a business man. But few employes have ever left him without a feeling of love and respect, and as a friend they never have known a better or truer one. In spite of the fact that Mr. Johnston is "business" and strictly business from the time he enters his office in the morning until he leaves it at night, which is sometimes not until 11 o'clock or after, he has come to realize what many a business man never learns, that he does not live solely to make money, but simply makes money to live. The weakest point in the manager of the Western Electrical Company is his big heart and anxiety for his fellow-man's welfare—to help, to pay and to give to those that need it, is the only condition that makes it doubtful if the future shall ever see a rich man by the name of G. W. Johnston.

Among the best citizens of his community Mr. Johnston enjoys an enviable reputation; though his personal attention to his rapidly growing business has compelled him to give up many positions and offices of trust and honor, his advice is always sought by the various undertakings and orders of which he is still a member, such as the Knights Templar, the Shrine, the Royal Arcanum, the B. P. O. E., the Omaha Field Club and the Omaha Commercial Club, of which latter two he is a charter member.

Mr. Johnston has lately built a cozy home in the best residence part of the city. This silently admits two facts of which his many friends and the business interests of Omaha are justly proud, namely, that he has achieved the success he made his start for thirteen years ago, and will remain a pillar for the upbuilding and prosperity of the community he has adopted as his home for the future.

IWAN POST HOLE AND WELL AUGER.

The Iwan post hole and well auger, herewith illustrated, represents the highest development of augers for earth boring, the many uses to which the Iwan augers are adapted making them almost indispensable for all purposes for which a hole in the ground is required.



The 10, 12 and 14-inch sizes are used exclusively by telephone companies for digging post holes, while the small sizes, four and five-inch, can be used for boring holes for anchors. The blades are made of crucible steel; they are riveted to a strong malleable arch, which is connected to the handle by a length of standard piping. They are very easily operated, being unexcelled for easy and quick work, hold the dirt well, and plenty of it, are easily emptied, and are very substantially and durably made. They will save their cost on the first mile of line construction. They are sold by hardware merchants and telephone construction supply companies.

Prices will be quoted by the manufacturers, Messrs. Iwan Brothers, Streator, Illinois, on application.

NEW PLANT ATTRACTS ATTENTION.

The new Independent telephone plant at Amsterdam, New York, is attracting unusual attention. A number of engineers and telephone men from various parts of the country have looked over the system and pronounce it one of the most complete and best built they have examined. At the same time it has cost considerably less per telephone than the usual plant. When the company reaches 2,000 subscribers, for which the plant is designed, the average cost per telephone will be less than $42, which includes all expenses, such as real estate, building, exchange equipment, engineering, etc.

The operating expenses will be very low, indeed, special attention having been paid to economy in the matter of maintenance and operation.

The company secured the Davis telephone rate adjusters for handling the canvass, and they have since May 3 rewritten more than 300 of the old subscribers at an advanced rate and are securing from ten to fifteen new subscribers per day. Indications are that they will be able to maintain this for at least the next two or three months, which will give a total increase of more than 1,000 telephones. The construction and operation of the Amsterdam plant has been under the supervision of L. W. Stanton.

STANDARD RINGER—STANDARD DUPLEXER.

The Current Electric Company, 52 State street, Chicago, is highly recommending its Standard Duplex Set for telephone exchanges. This instrument has been found to be efficient and practical for various purposes in connection with telephone service. With this Duplexer one can connect a telephone to any ordinary good metallic circuit, so as to render absolutely private service to the Duplexer telephone, and not interfere in any way with the service of the original circuit—that is, there will be two circuits absolutely independent of each other.

An extension party line also may be had by connecting the Duplexer to a metallic circuit and running a single wire to any desired points. For example, suppose you have a metallic circuit extending out, say, eight miles from your exchange with ten or a dozen telephones on same; then suppose there are half a dozen parties beyond this line who would like telephone service, but you cannot afford to run a line all the way out from your exchange to accommodate them. You can connect the Duplexer to the end of the metallic circuit and run a single wire the necessary distance to connect the parties on a line that will be absolutely independent of the original circuit.

A metallic bridging line also may be divided so that it may be used as two separate circuits, thus allowing double service over the line without any additional expense, except the first cost of the Duplexer. This will add greatly to the service of bridging party lines with very little expense. The only requirements to use the Standard Duplexer for any of the above mentioned purposes is to have an ordinary good metallic circuit, such as most exchanges now have, and to keep it clear of the ground on each side. Many will doubtless be glad to learn where they can purchase an apparatus as convenient as the Standard Duplexer.

The Current Electric Company reports large and rapidly increasing sales on its Standard Ringer, which it fully guarantees to do the work on any telephone exchange, and will send on thirty days' trial. The following is one of many letters acknowledging the superior merits of this Ringer:

Rantoul, Illinois, May 9, 1905.

Current Electric Company, Chicago, Illinois—Gentlemen: Please send us by express one of your latest style ringers. The ringer which we now have is giving good service. Yours truly,

COON BROTHERS.

WILLIAMS SIMPLEX RELAY SWITCHBOARD.

The problem of supplying the rural trade with a telephone that will meet their particular needs has been a difficult one for the manufacturers to solve. Those familiar with the rural situation know the requirements are many, but by years of careful and thoughtful study, manufacturers have made it possible for the farmer to realize the advantages of telephonic communication. As a result, the farmer farmer has entered into the work with energy and enthusiasm. Lines have been extended and new ones built, until the farmer has found it to be of vital importance to be connected with every home in his community. This constant increase in country lines, and the desire for a wider range of communication, has rendered imperative the need of a proper switching device. What the farmer needs most in such a device is an article practical and simple in construction and fitted to his own peculiar conditions.

FRONT VIEW OF SWITCHBOARD.

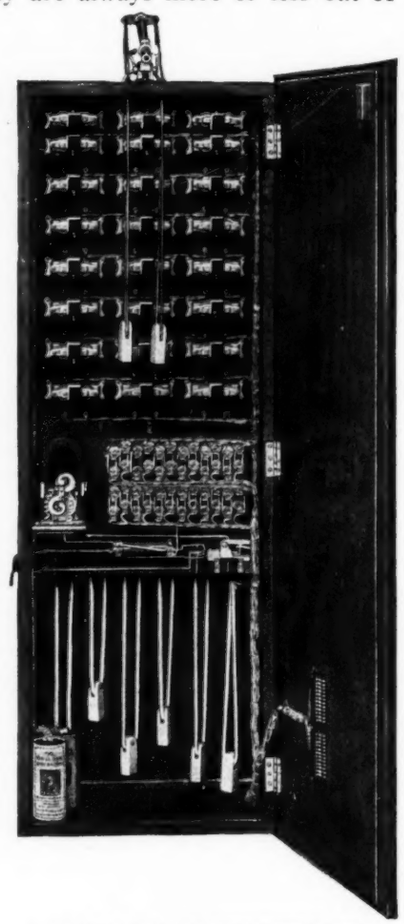
In a great many instances, the cause of the failure of a number of switchboards placed on the market for rural communities has been simply because they did not embody the prime factors which should of necessity enter into the construction of a switchboard. In some cases, switchboards adapted only to the use of large exchanges were furnished the country districts. In other instances, city boards were reconstructed with the object in view of compelling them to meet the peculiar rural requirements. The result was that the board became clumsy and uncouth in appearance and burdensome in operation. Because of the delicate mechanism involved, the cost of maintenance was considerably increased, as such a board constantly demanded the attention of a "troubleman."

Manufacturers have spared neither time nor expense to cope with this difficulty, and as in the case of the telephone, are meeting and overcoming it to such an extent that they are furnishing boards which a farmer himself can install, and for the operation of which he will not have to depend on expert employes. Chief among the good points is the all important one, that they must meet the conditions required of them. The field, of course, is a large one, with ample room yet for improvement, and in this connection, the Williams Telephone and Supply Company of Cleveland, Ohio, is just placing on the market a board, known as its Simplex Relay Switchboard, which it has found eminently fitted for the rural trade. The idea carried out in its construction embodies simplicity, durability, efficiency and adaptability to rural conditions.

A number of switchboards supplied to the rural districts, are equipped with 500 or 1,000-ohm drops, and where higher resistance telephones are connected, there is naturally a low path for the current and considerable loss of power, causing the bells on the telephones to operate poorly. On this new Williams board, the drops are formed of polarized ringers—the ringer ordinarily used on a telephone—and each ringer installed on the board is wound to the same resistance as the ringers on the incoming line, so that the board is simply an extension bell proposition, taking the place of another telephone.

We all know that considerable difficulty has been experienced by manufacturers in producing a switchboard which would reproduce the signal given by the calling party exactly as it was sent out. On rural party lines, where a system of signals is of necessity in use, each signal calls some certain member of the line, and on some boards it has been impossible to reproduce at the switch the ring exactly as given by the calling instrument. The drop would fall, ringing the bell continuously, until restored, and this, of course, necessitated constant attention on the part of the operator, as in the case of each call she was obliged to cut in on the line and ascertain whether or not the switchboard was wanted. This constant attention made the cost of maintenance high.

Relay drops have been built to overcome this, and in a measure they have been successful, but the mechanism controlling them is so delicate and the wiring so intricate, that they are always more or less out of order, requiring the time and expense of an electrician, as well as proving very annoying to the switchboard attendant.



REAR VIEW OF SWITCHBOARD.

The Williams Telephone and Supply Company has met this contingency in its switchboard, and states that it does not rely on the use of frail, delicate and complicated connections to give the ring as originally sent out by the subscribers. By the use of the ringers, wound to the same resistance as that of the instrument of the calling party, the current from the signalling instrument is transmitted at once into the ringers of the switchboard. In this way the ring is reproduced exactly as given, as in the case of an ordinary telephone. This, as can be readily seen, naturally eliminates the need of constant attention on the part of the operator, as she need respond only when her ear recognizes the predetermined switchboard signal. These ringers are interchangeable, and if at any time the owner of the switchboard desires to change the resistance of the ringers, it can be accomplished without any difficulty whatever.

Each line coming from the ringer is wired to two jacks,

so that a cross connection can be made, enabling the operator, by means of her operator's plug, to place herself in circuit for talking with any two connected lines. This arrangement also serves another purpose. Should a ring come in on a line, say, for instance, No. 1, the operator would take her operator's plug and insert it in the lower, or answering, jack of the corresponding number. At the same time, she would insert one end of her connecting cord in the upper jack of the same line. Having ascertained from the calling party whom is desired—say No. 6—she removes her operator's plug from the lower jack of No. 1 and places it in the upper jack of the line wanted, No. 6. On the operators' ringing out on the upper jack, No. 6, the drop at the switchboard corresponding to this line would not fall. As soon as she secured the party wanted, she would insert the other end of her connecting plug in the lower jack of the drop corresponding to the line called for, No. 6, putting them in connection for talking. She would then remove her operator's plug, or leave it inserted, should she desire to remain on the line. In this way, but one ringer is in circuit on the two lines, and serves as a clearing out, or ring-off signal, besides causing but a minimum leak across the line.

From this description it will be seen that the operator should make connections with rapidity and perfect ease and without prior knowledge of the workings of the switchboard.

The cabling from the ringers to the jacks is formed up of twin switchboard wire, having both cotton and silk insulation. They are so twisted and formed that there is no annoyance from cross talk or induction, all circuits being perfectly balanced. All other wiring in the switchboard is done with okonite, or moisture proof wire. The jacks are mechanically strong and highly efficient electrically. Their contacts are formed on platinum points, which insure good connection under all changes of temperature.

The terminal wires are carried to a distributing rack, having ample space for numerals representing the different lines and for the soldered line connection. The indicating device is purely mechanical, not depending on any electrical circuit for its operation, and is one of the strong features of this switchboard. It is simple in construction, and susceptible to the slightest movement of the ringer, and is so made as to restore without difficulty under any position of the bell hammer. There is little, if any, friction in its operation, and it is therefore very positive in its action.

The operator's set consists of the new style long-distance transmitter, which can be raised or lowered at the will of the operator. The switch-hook is of the platinum contact type, and the receiver can be furnished in the regular style, or head band attachment. The five-bar generator used in this board is expressly fitted for use in a switchboard, being extremely powerful. The plugs used are of the small multiple type, easy to handle, and are electrically perfect in construction. The cabinet in which this apparatus is mounted is made of well seasoned quarter-sawed oak, highly polished, and presents a handsome appearance.

Another important feature of the board is that the farmer can himself install, manage and maintain it. In being able to do this, he naturally takes a keen personal interest in it, and is inspired to make it a successful home venture, and one of the institutions to which he can point with pardonable pride. Convinced of its superior quality, he is not only willing, but eager, to give it his unqualified endorsement.

The Williams Telephone and Supply Company purposes to have a sample of this Simplex Relay Board on exhibition at the convention in Chicago in June.

"MODEL" SELECTIVE TELEPHONE.

One of the new, prosperous and growing industries of Burlington, Iowa, is the Model Electric Company, which makes a specialty of the manufacture of four-party selective, bridging and series telephones. In particular, at the present time, the company is pushing the sale and manufacture of the selective telephone, which is shown in the accompanying illustrations. At the convention recently held at Des Moines by the Iowa Independents the Model company had a fine exhibit of its telephones. From a folder issued by the company we take the following discription of the Model four-party selective system:

"With the wonderful and rapid growth in the Independent telephone field in last five years, and with cheap rates, a great number of exchanges have found that in order to pay dividends they have been compelled to adopt selective

MODEL SELECTIVE TELEPHONES ON DRESS PARADE.

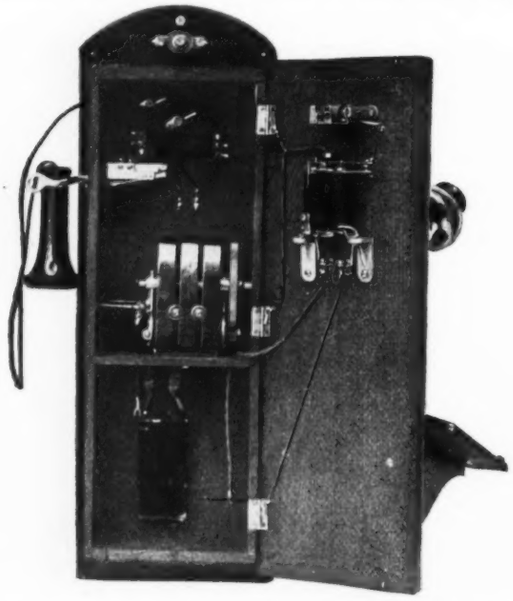
party line systems. The systems previously used have entailed a great deal of expense in installing special power and other apparatus to signal subscribers. The present subscribers' stations are also a source of trouble and have to constantly be watched and kept to a nicety in adjustment.

"In Model Selectives we have endeavored to eliminate all points of complications, which enables us to place on the market a selective type instrument along entirely new lines, and at the same time one that is very simple and positive in selecting. The cost of maintenance is very cheap on this type of instrument, as the selector is easy to adjust and permanent in adjustment.

"The equipping of the central stations is also to be commended for its cheapness. It requires sixty cells of dry battery and one selecting key on each position, or, where companies are using the Warner generator, they can use batteries from generator and not interfere with alternating current from generator. The cost is then cut down to a vey low figure, as all that is needed is our selecting key. This key we wire up complete with three feet of double

silk single cotton beeswaxed annunciator wire, all tagged and numbered with full directions for installing.

"The diagram 3 of our selective telephone, which will be sent upon request, shows our method of wiring selective key, also of connecting to R. and L. key, and alternating



INTERIOR VIEW, MODEL SELECTIVE TELEPHONE.

power generator cut in to cam, but by pressing levers either way, you disconnect generator from cam and make contact with direct current from power batters. This action also connects one side to ground, either positive or negative, according to party wanted. This in turn actuates a polarized relay in subscriber's station, which closes a vibrating bell circuit. The vibrating bell is furnished

EXTERIOT VIEW, MODEL SELECTIVE TELEPHONE.

power from local batteries in instrument. After call has been made lever is restored to normal position, leaving power leads on open circuit and throwing generator leads back on cam.

"The diagram also shows our simple method of arranging circuits. To signal central we use a three-bar bridging alternating generator, as all relays are adjusted to ring from power battery only. Alternating currents have no effect on relays. Therefore, it is impossible to ring or disturb other parties on line.

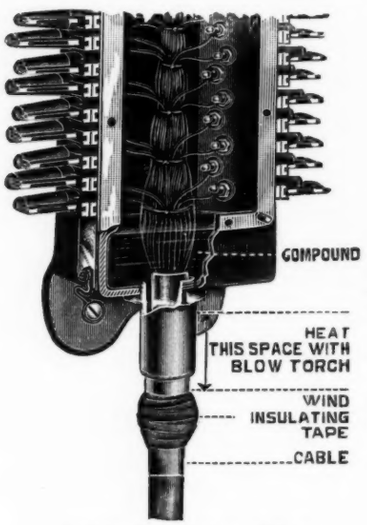
"In order to facilitate office testing we have included a condenser in secondary circuit. By removing receiver from hook our ground through relay is cut off of line. This, then, gives us clear line to test over.

"The diagram 4 further shows our method of connecting our signaling apparatus to lines. In the construction of this apparatus we use platinum contacts throughout. Our vibrating bell is also of special design with heavy platinum crown and point."

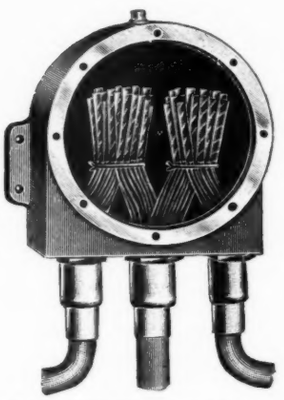
For detailed information regarding this telephone write the Model Electric Company, Burlington, Iowa.

A FEATURE OF MOON TERMINAL APPARATUS AND SPLICING BOXES.

All cable apparatus as now manufactured by the Moon Manufacturing Company of Chicago has a distinctive feature to which the company calls attention, and which is



MOON TERMINAL HEAD.



MOON JUNCTION BOX.

shown in the accompanying cut of a section of a Moon terminal head with self-soldering nozzle.

A compartment is provided at the lower part of each Moon terminal head, and also of each Moon junction box, which may be filled with cable compound. The compound surrounds the cable wires and covers the end of the cable sheath, sealing the cable even when the box is opened for any purpose, and affords an additional seal to the cable, when the box is closed. This compound also runs down into the space between the top of the nozzle of the box, and the cable sheath, forming a perfect seal in addition to the cable joint.

This is only one of the many details carefully worked out, and which mark all Moon apparatus, making it thoroughly practical and absolutely reliable under all conditions.

AMERICAN CONSUL AT PRAGUE TO PUSH AMERICAN PRODUCTS.

The American consul at Prague, Bohemia, Austria, has adopted a system by means of which he will be able to place American manufacturers in touch with possible Bohemian purchasers with the least possible delay. He proposes to keep on file at Prague circulars, bulletins and matter describing American products. When an inquiry is made to him concerning a piece of apparatus the descriptive matter

can be sent to the inquirer and the order for it immediately cabled to the manufacturer.

Manufacturers of telephone apparatus are requested to favor the consulate with the following commercial data: Name of firm; street, city and cable address; codes used; export discounts and terms; languages of correspondence; references or commercial rating; nature of exports and imports; list of their foreign branches and agents. Which they will accompany with catalogues, price-current, discount-sheets, circulars, photographs, small samples, etc.—in fact, with the commercial literature necessary to assure immediate sales.

"CENTURY" APPARATUS IN DEMAND.

The Consolidated Telephone Company of Buffalo, New York, which controls fifty exchanges in western New York and the long-distance system of the Inter-Ocean Telephone & Telegraph Company, has purchased the Frontier Telephone Company of Buffalo. The Consolidated company controls the Century Telephone Construction Company, manufacturers of "Century" switchboards, telephones and other apparatus.

Owing to the constantly increasing demand for "Century" apparatus, extensive additions to the manufacturing plant of the Century company will be made at an early date. "Century" apparatus is used exclusively in all exchanges controlled and operated by the Consolidated Telephone Company, and recent additions to the territory of the Consolidated company make the immediate enlargement of the factory facilities imperative.

The Century Telephone Construction Company recently has received orders for switchboards from the following companies: Livingston Rural Telephone Company, Dalton, N. Y.; Canisteo Telephone Company, Canisteo, N. Y.; Wellsville Telephone Company, Wellsville, N. Y.; The Burdette Telephone Company, Burdette, N. Y.; Cato Meridian Telephone Company, Cato, N. Y.; Port Byron Telephone Company, Port Byron, N. Y.

The Century Company's offices have been moved from Ellicott Square to 332 Ellicott street, which also is the home of the Frontier Telephone Company.

TELEPHONE ACCOUNTING AND FILING SYSTEMS

We are pleased to call the attention of our subscribers to the business of the Edwards-Hine Company of Grand Rapids, Michigan, which is making a specialty of telephone accounting and filing systems, maintaining a special department for that purpose.

We had the pleasure recently of personally inspecting a portfolio containing a complete set of the records and forms designed by it and installed for the Citizens' Telephone Company of Grand Rapids, Michigan. It was certainly the most systematic and complete set of records we have ever seen. This company has the second largest automatic exchange in the world and is now operating seventy-eight exchanges and 145 toll stations in its present system with constant demands, for further extensions. The accompanying illustration shows the Citizens' Telephone Company's general office with the new system outfit, grouped in the foreground.

VIEW OF NEW SYSTEM AND GENERAL OFFICES OF CITIZENS' TELEPHONE COMPANY, GRAND RAPIDS, MICHIGAN.

The increasing demand of the business world for better long-distance telephone service has clearly shown the great necessity of a uniform system of accounting and filing of records among all connecting companies, to enable them to adjust their interchange business and mileage in a fair and equitable manner and at a minimum cost.

This need has brought about the traffic association or clearing house method in different states for the proper handling of this "interchange business." The Independent companies of Michigan have fallen into line and established a traffic association, to care for their rapidly increasing toll business. We are able to publish a half-tone reproduction of their new system, designed by the Edwards-Hine Company.

The Edwards-Hine Company occupies the entire double four-story and basement building at 5 and 7 Pearl street, Grand Rapids, Michigan, giving it some 25,000 square feet of floor space. The ground floor is occupied by the printing department, which is equipped with the latest pattern "Century" cylinder and "Universal" job presses, all of which are run by direct individual electric motors. The company's policy in type faces is to keep strictly up to date and it is showing all the latest styles, in addition to the standard faces.

The second floor is given over to the bindery proper and main office. Here all the latest machinery (run by electric motors) is used in the manufacture of loose leaf goods, blank books, leather novelties and in general binding.

The third floor is occupied by the telephone systems department, drafting room and sample room, with special stock room for manufactured goods, forms and devices for telephone, gas and general business accounting and filing systems. Here also is located the ruling department, which is equipped with the largest and most rapid labor-saving machines known to the trade.

The fourth floor is used as a general paper and material stock room, where are kept filing cabinets, card systems, etc. From seventy-five to 100 skilled workmen are employed, each department being under the personal supervision of a master craftsman.

The building is modern, well lighted, equipped with electric elevators, gas and electric fixtures being also provided for the night shift, as the company is often obliged to run an extra force to keep up with its orders.

We are informed that it is the Edwards-Hine Company's intention to have at least two expert accountants from its telephone systematizing department in Chicago during the week of June 17 to 22, in attendance at the annual convention of the National-Interstate Independent Telephone Association, where it expects to have on exhibition a full and complete line of its time and expense saving systems and devices.

NEW SYSTEM OF MICHIGAN INDEPENDENT TELEPHONE TRAFFIC ASSOCIATION.

HAVE YOUR TICKETS READ VIA LAKE SHORE.

The Lake Shore & Michigan Southern Railway has made special arrangements for the comfort and convenience of telephone men attending the coming National-Interstate telephone convention at the Auditorium Hotel, Chicago, on June 20, 21, and 22, and requests that those attending have their tickets read via Lake Shore & Michigan Southern Railway. A special rate of a fare and a third for the round trip has been made from all points. Delegates should request a certificate when purchasing tickets.

The Lake Shore has always made a special effort to accommodate telephone men at past conventions and most telephone men travel on this road in appreciation of this fact and for the further reason of its superb equipment.

For further information consult any Lake Shore ticket agent or write L. V. Vosburgh, General Western Passenger Agent, Chicago.

Trade Notes

THE AMERICAN STONE CONDUIT COMPANY has located in new offices at 423 Chamber of Commerce building, Chicago.

THE KEYSTONE ELECTRICAL INSTRUMENT COMPANY has moved its New York office from 15 Cortlandt street to 51 Dey street.

THE NATIONAL TELEPHONE HOLDER COMPANY has been incorporated at Boston with a capital stock of $40,000. Incorporators, Fred A. Ewell, H. B. Mitchell, Charles F. David.

JONATHAN A. RAWSON, JR., 130 Pearl street, New York city, is selling agent for a line of time-saving devices for telephone users and has issued a catalogue telling of the goods that he handles.

THE STANDARD MANUFACTURING COMPANY, formerly of Meriden, Connecticut, a concern which manufactures speaking tubes and private line telephones, has moved its plant to Bridgeport, Connecticut.

THE POSTAL TELEPHONE COMPANY has been organized at Portland, Maine, to deal in telephone instruments, with a capital of $500,000. H. E. Mason, Portland, is president, and J. J. Hernan is treasurer.

THE GEMMILL TELEPHONE AND MANUFACTURING COMPANY, Orville, Ohio, has filed an amendment with the secretary of state changing its name to the United States Telephone and Switchboard Company.

THE PORTER BATTERY COMPANY, Chicago, is now manufacturing the Porter storage battery in a form especially adapted to telephone work, and invites all interested parties to write for detailed information.

THE CINCINNATI ELECTRICAL TOOL COMPANY, Cincinnati, Ohio, will be pleased to send to anyone who desires it its catalogue describing in full the portable electrical drill and electrical grinder that it manufactures.

THE TELEPHONE WOOD WORKING COMPANY, Tiffin, Ohio, has been incorporated with a capital stock of $50,000. The incorporators are W. H. Roose, John A. Belford, John R. Calder, T. C. Averill and Fordyce Belford.

THE FISK-NEWHALL TELEPHONE MANUFACTURING COMPANY, Chicago, has placed upon the market a new punched switch-hook. The company claims for the new hook greater strength, accuracy and cheapness.

THE MEIRS ELECTRIC COMPANY has been incorporated at Indianapolis. President, Frank L. Meirs. The purpose of the company is to manufacture telephones and construct, manufacture, and repair electric machinery and apparatus.

THE WESTERN TELEPHONE AND TELEGRAPH COMPANY, Chicago, manufacturer of composite telegraph apparatus, has issued an attractive illustrated catalogue relative to its product. Besides showing pictures of the telegraphone, it also gives designs of the telegraplex, combination telegraphone and telegraplex, and siding telephone. Each is fully described. The company will be pleased to send the catalogue to anyone interested.

THE ECCLESTON LUMBER COMPANY has removed from 29 Broadway to 44-46 Broadway, New York city, where all inquiries for telephone poles, pins, brackets and cross arms should be addressed.

THE firm of Baumflek & Felsenthal, telephone contractors, 3737 Vincennes avenue, Chicago, has been dissolved by mutual consent, Mr. Felsenthal retiring and being succeeded by B. J. Schramm, well known in street railway circles.

I. A. BENNETT, Chicago representative for the Marion Wire & Cable Company and other concerns operating in the telephone field, has removed to commodious new quarters on the ground floor at 141 South Clinton street, Chicago.

WILLIAM F. GRADOLPH has severed his connection with the Central Telephone & Electric Company, St. Louis, and has gone into business for himself as a consulting and constructing telephone engineer, his office being at 806½ Chestnut street, St. Louis.

PRACTICALLY everything in the line of tools used by the telephone and kindred interests is furnished by Mathias Klein & Sons, 81 West Van Buren street, Chicago. This firm has supplied the needs of many telephone companies, and is kept busy filling orders.

THE NATIONAL CABLE AND WIRE COMPANY'S general offices have been removed from Pittsburg to its commodious new manufacturing plant at Shousetown, Allegheny county, Pennsylvania, which point will in the future be its mailing, telegraphic and shipping address.

THE MODEL ELECTRIC COMPANY, Burlington, Iowa, is distributing a card on which is a half-tone reproduction of a pair of Model selective telephones and portraits of the proprietors of the company, below which is a little verse lauding the merits of the Model Selective telephone.

THE NATIONAL BATTERY COMPANY, Buffalo, New York, is distributing a booklet, illustrating the various types of storage batteries made by this company. These include batteries for power station, for telephone work, railway signal systems, car lighting, gasoline ignition and electric vehicles.

THE C. A. MANUFACTURING COMPANY, Austin, Texas, has issued a booklet bearing upon the merits of "C. A. Wood Preserver" (Carbolineum America), and containing numerous letters testifying to its merits as a wood preservative. It is especially noticeable in preventing decay in telephone poles.

"THE SAME OLD THINGS" is the title of a neat little booklet being distributed by the American Electric Fuse Company, Chicago. It relates to "American" self-soldering protectors, and contains many illustrations of these and other supplies along the same line. The booklet will be sent upon application.

THE CENTRAL ELECTRIC COMPANY, Chicago, is sending out price list No. 10, covering D. & W. enclosed fuses and safety devices. In this price list every line of new code fuses is listed and the arrangement and classification have been given careful consideration with the view to making it compact and convenient for quick reference. The Central Electric Company, as the general western selling agents

for D. & W. enclosed fuses and safety devices, will mail one of these catalogues to any user of electrical material on request.

THE CHICAGO TELEPHONE SUPPLY COMPANY, Elkhart, Indiana, has sold to the Alaska Telephone and Telegraph Company of Nome, Alaska, a full central energy equipment, including lamp line switchboard and telephones and construction material for the purpose of entirely rebuilding the telephone system at Nome.

THE W. C. STERLING & SON COMPANY, Monroe, Michigan, is this year celebrating its silver anniversary. The Sterling company started in the cedar business by supplying the Western Union Telegraph Company with poles, twenty-five years ago, and from this small beginning has built up an immense trade.

W. W. SMYTHE, JR., western manager of the Fibre Conduit Company of Orangeburg, New York, whose office is located in the Monadnock block, Chicago, reports that their factory is working day and night filling orders for their product—fibre conduit—which have been received from companies throughout a large part of the United States.

THE DELAWARE HARD FIBER COMPANY, Wilmington, Delaware, whose western sales office is in charge of Messrs. A. J. Cox & Company, 1214 Chicago Stock Exchange building, Chicago, is paying particular attention to the manufacture of vulcanized hard fiber in sheets, rods, tubing and special shapes entering into the manufacture of telephones.

THE WILLIAMS TELEPHONE AND SUPPLY COMPANY, Cleveland, Ohio, has issued a booklet which, under the title of "A Short Trip to Town," illustrates and describes the telephone apparatus manufactured by the company. This apparatus includes lightning arresters, transmitters, receivers, magneto generators, induction coils, extension bells and complete sets.

THE INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, Chicago, reports that it is having a heavy demand for its transmitters, especially for switchboard use on long-distance toll line systems. It claims that the International transmitter, provided with its own make of special granular carbon, is the most clear and distinct long-distance talker ever produced.

POLES are reported by the F. Bissell Company of Toledo, Ohio, as in heavy demand and none too plentiful for actual stocks. They are doing a big business in this line and filling orders rapidly, but it is suggested that those who intend purchasing this season defer no longer than compelled to, for the indications all point to a shortage, particularly in thirty-fives and up.

JONES & WINTER, 1259 Monadnock Building, Chicago, will build the exchange at Meridian, Mississippi, which will have a capacity of 1,500 lines installed. The Cumberland company, which gives a miserable service there, is preparing to rebuild, but the popular sentiment is in favor of the Independent company, which will without a doubt soon put its older rival out of business.

A NOVEL conceit in the way of advertising is the "Life, Fire and Accident Insurance Policy" recently issued to the telephone fraternity by Frank B. Cook, Chicago, manufacturer of telephone protector apparatus. On the outside it has all the earmarks of a genuine insurance policy, and is, to say the least, an unique way of setting forth the merits of the Cook protective apparatus. On the inside and back pages are numerous illustrations and descriptive matter carrying out the general theme and impressing the reader most favorably. A Cook "policy" may be had for the asking.

ARTICLES of incorporation of the Telegraphone Company of America, of Augusta, Maine, have been filed with the secretary of state. The capital stock is $10,000,000, divided into 100,000 shares of a par value of $100. The purposes are to carry on the business of manufacturing, buying, selling, and dealing in telegraphonic and telephonic instruments, phonographs and graphophones. The company was incorporated at Portland.

C. H. JUDSON, telephone engineer, is just completing for the Mutual Telephone Company of Des Moines, Iowa, the installation of a 4,000-line, all-cable plant—the largest all-cable plant on the multiple tap system in that part of the country. The Des Moines system has been entirely rebuilt and is equipped with central energy Stromberg-Carlson apparatus. The company has installed its switchboard in a fireproof building on Grand avenue.

THE DEAN ELECTRIC COMPANY, Elyria, Ohio, recently has furnished common battery exchange equipments, including switchboards and metal box hotel telephones, for Keeler's Hotel, Albany, New York, and for the new Warner Hotel, Amsterdam, New York. All of this apparatus is standard Dean equipment, but owing to its construction is especially adapted for hotel work, as it is made to stand the rough usage to which such equipment is always subjected.

ON Friday, April 7, application was made by Thomas H. Wilson of Logansport, Indiana, for the appointment of a receiver for Wilson, Humphreys & Company of Logansport. The company has a capital stock of $90,000, and the liabilities are placed at approximately $37,000. The application makes further averment that the corporation is in imminent danger of insolvency. This concern is known to Independent telephone industries as the publisher of Sound Waves.

THE GENERAL ENGINEERING COMPANY, Chicago has recently closed contracts to build 100,000 duct feet of subway for the new lighting plant of the Sioux City (Iowa) Traction Company, including all cables, services, etc.; 15,000 feet extension of the underground plant of the Cedar Rapids & Marion (Iowa) Telephone Company, and for rebuilding the plant of the Canton (South Dakota) Telephone Company, including the moving of its central office into a new building.

THE WESTERN TELEPHONE MANUFACTURING COMPANY announces that it has had a large demand for rural, as well as for exchange, telephones, the increase being 25 per cent above that of last year. From the numerous inquiries for four-party selective telephones, both central energy and magneto, it appears that the future looks very promising. Catalogues and circulars will be furnished free upon application. Address, Western Telephone Manufacturing Company, 36-50 West Jackson boulevard, Chicago.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, announces that, although its "Leader, Jr.," telephone has been on the market only a short time, it has received orders for two complete exchange equipments of 150 instruments each and has started over 100 customers to using this telephone exclusively on their future extensions. It is well to remember that the Central company will send a sample of its Leader, Jr., telephone on thirty days' trial, freight prepaid, to any responsible party in the United

States, and a sample of its fuse block and fuse free on request to anyone mentioning this paper.

F. V. L. TURNER, 116 Nassau street, New York City, reports the sale of an extension of 420 lines and telephones to the Commercial Union Telephone Company, Troy, New York; a private branch exchange and fifty-four telephones to the Brooklyn Heights Railroad Company, Brooklyn, New York; a complete magneto exchange, telephones and construction material for Zanibar, South Africa; telephones to the Granville Telephone Company, Granville, New York, and several smaller sales of apparatus and telephones throughout the state.

MARK P. BOONE, superintendent of the Peru (Ind.) Home Telephone Company, has applied for a patent on a lock-out device, intended to overcome the lack of privacy on party lines. The device can be placed on any central-energy telephone and can be manipulated with as much ease as a telephone on an independent line. The officials of the Peru Home Telephone Company will at once introduce the lock-out system on its country lines, thereby, it is hoped, affording country patrons as much privacy as if they were on an Independent line.

AT A recent meeting of the directors of the Stromberg-Carlson Telephone Manufacturing Company, at Rochester, New York, it was decided to install an automatic system of sprinklers as an additional source of protection against fire in the great plant. As the shops cover several acres the installation of such an equipment is something of an undertaking, but the effect upon insurance rates is material. In some of the buildings the machinery is complicated and expensive, while the materials used in the construction of the instruments and wire coverings are valuable.

THE NATIONAL CONDUIT AND CABLE COMPANY, 41 Park row, New York city, manufacturer of bare copper wire, weatherproof wires and cables, lead-covered wires and cables for telephone, telegraph and electric and power work, has issued its bulletin, "Copper Gossip," dated May 20. This bulletin gives notes on the general business outlook, the copper market situation, the London copper market, New York and London copper prices, exports of copper, imports of copper, copper mining news and developments, and European copper statistics. Every telephone man should arrange to get "Copper Gossip" regularly.

THE STANDARD TELEPHONE COMPANY, Milwaukee, Wisconsin, has secured a number of switchboard orders for completely equipping various exchanges, among them being the one at Waterloo, Wisconsin, with a 200-line No. 8 oak arrester frame, the switchboard having the Standard's latest method of taking out the drops from the rear of the switchboard, which has caused quite a stir. Kahoka, Kansas, is to have a 300-line switchboard and full arrester equipment. It is the new switchboard drops and jacks that have caused this demand for Standard apparatus and the company has prepared to meet all orders in a rush.

THE WILLIAMS TELEPHONE AND SUPPLY COMPANY, Cleveland, Ohio, has made many additions to its present equipment, which further increases the efficiency of its product. This company has always held the reputation of manufacturing apparatus of the highest standard of quality. A new charging solenoid has been installed whereby a net gain of twenty-five per cent has been made in the strength of its generators; also a new complete line of testing instruments of the latest pattern has been purchased. Many other changes have been made, which add to the character of its output, and the company reports a very satisfactory increase in business over that of preceding years. A cordial invitation to visit their factory is extended by the company to all interested in telephone manufacture.

AT THE annual meeting of the stockholders of the Vought-Berger Telephone Company, held in the offices of the company at LaCrosse, Wisconsin, it was decided to erect a brick building adjoining the factory building on the south, to house a new 150-horsepower boiler and a large dry kiln. With the constant growth of the business of the company the present engine capacity has been found to be inadequate and the building of the new engine and dry kiln addition will be the first step toward the ultimate enlarging of the factory. Plans for the new building were drawn at the meeting. The work of building will be commenced at once.

THE GENERAL INSULATE AND MACHINE COMPANY, Brooklyn, New York, announces that it has appointed as its western sales agents, Messrs. A. J. Cox & Company, 1214 Chicago Stock Exchange building, Chicago. The General Insulate and Machine Company was organized by Joseph Steinberger, who is the pioneer in the manufacture of hard rubber substitutes. It has a large and well equipped factory with the most modern machinery and claims to manufacture the very best substitute for hard rubber that can be produced. It is in a position to make prompt deliveries, and Messrs. A. J. Cox & Company will be pleased to quote prices and submit samples of material.

THE CONGRESS HOTEL COMPANY, Chicago, operating the Auditorium Hotel, Auditorium Annex and Congress Apartment Building, announces that the Auditorium Hotel has been selected as the headquarters of the National-Interstate Independent Telephone Association on the occasion of the annual convention in Chicago, June 20, 21 and 22. Reservations may be made at rates ranging from $2 and up per day for rooms without bath, to $3.50 and up per day for rooms with private bath. It is suggested that reservations be made by mail or telegraph at the earliest possible moment, as there will be a large attendance at this convention and an unprecedented demand for rooms.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, New York, reports having recently closed contracts for switchboards for the following places: Louisville, Ky.; New Berlin, Rochester, Wayland and Candor, N. Y.; Kenmore and Norme, N. D.; Kemp, Lawnridge and Trivoli, Ill.; Pittsboro, Sanford and Kernersville, N. C.; West Brownsville and Altoona, Pa.; Camden, N. J.; Newberg, Ore.; Butte, Mont.; Newport, Tenn.; Ostrander, Minn.; Litchfield, Mich.; Columbus, Adena, Conotton and Willshire, Ohio; Plymouth and Clatonia, Neb.; Brigham City, Provo and Logan, Utah; Atlanta, Ga.; Le Mars, Iowa; Liberty, Mo.; Prosser, Neb.

THE BAIRD MANUFACTURING COMPANY, 24 Michigan street, Chicago, is said to have made a great hit in the purchase of the business of the Norstrom Lock-Out Telephone and Manufacturing Company, as orders are being received as fast as they can be filled. The Lincoln (Neb.) Telephone Company has just ordered 100 additional complete telephones, after having thoroughly tested thirty since January. A new folder filled with information and testimonials has just been issued and may be had on application. The Baird company's business in telephone pay-stations has lately been booming, it having received an order for 1,900 pay-stations from one large telephone company, and the general business has been exceptionally good. The Baird permanent friction telephone arm is meeting with great favor and the company has found it difficult to keep up with the demand.

Personal

Dr. J. T. Liddy and associates have applied for a franchise to install a telephone system at West Palm Beach, Florida.

Arthur Kneisel has accepted the position of manager for the Eastern New York Telephone and Telegraph Company at Hoosick Falls, New York.

Howard Mitchell of Mt. Sterling, Wisconsin, has purchased the Star Telephone Company and will remodel the system and put it into first-class condition.

Theodore Gary of Macon, Missouri, has been looking over the People's Telephone Company's plant at Chillicothe, Missouri, with a view to purchasing same.

T. H. Ewing has taken the position of Iowa representative for the American Electric Telephone Company of Chicago. His headquarters will be at Des Moines.

C. C. Spalding and others of Sunnyvale, California, have organized a rural telephone company, which will connect Sunnyvale with the rural districts west and south.

M. A. Gurney has connected himself with the firm of Frank B. Cook, Chicago, and will travel in the states of Michigan, Indiana and Ohio, selling the Cook apparatus.

Frederick S. Dickson, president of the Cuyahoga Telephone Company of Cleveland, Ohio, is mentioned as a possible candidate for the mayoralty nomination in that city.

Frank Wilson of Ottawa, Ohio, has become manager of the Continental exchange of the Putnam Telephone Company, succeeding A. E. Ward, who has gone to Albion, Indiana.

J. P. Clark, formerly secretary and treasurer of the Corning, Iowa, Telephone Company, has disposed of his interests, amounting to $8,500, to G. H. Currier and others of Prescott.

Edward A. Tyler has taken a position as salesman with the Hipwell Manufacturing Company of Allegheny, Pennsylvania, and is at present covering the west in the company's interest.

Charles Avery, manager of the Minnesota Mutual Telephone Company and Maple Leaf Telephone Company of North Branch, Minnesota, has resigned and will engage in other business.

Herbert J. Jeffrey, formerly chief installer and salesman for the Sterling Electric Company of Lafayette, Indiana, has been appointed manager of the Bedford (Ind.) Home Telephone Company.

Fred A. Owen, president of the Dansville (N. Y.) Gas and Electric Light Company, and some fifteen or twenty prominent citizens of that and nearby villages, will organize a home telephone company.

W. N. Curtis has resigned his position as inspector for the Wilton (Iowa) Telephone Company, and has accepted a position as superintendent of the T. & A. Selective Call Company of Geneseo, Illinois.

Dr. L. O. Jenkins has resigned as secretary of the Wabash Valley Telephone Company at Paris, Illinois, and has been succeeded by J. E. Parrish. Roscoe Wright was appointed manager of the Paris exchange.

Alva J. Carter, who represents the Monarch Telephone Manufacturing Company of Chicago in Iowa, South Dakota, Nebraska and Minnesota, has changed his headquarters from Des Moines to Sioux City, Iowa.

James F. Boyle, manager of the Pittston, Pennsylvania, office of the People's Telephone Company, has been transferred to Scranton as manager of the material department, entering upon his duties in that city May 1.

Harry L. Voute has resigned his position with the Toledo (Ohio) Home Telephone Company to accept the general managership of the Southern Telegraph and Telephone Company, at Hot Springs, Arkansas.

J. D. Ream has been elected president and M. S. Eddy secretary of the new co-operative telephone company which was recently organized at Custer, Nebraska, and which proposes to buy out the Central Telephone System.

D. A. Reynolds, vice-president and manager of the State Line Telephone Company of New York City, has organized an Independent company at Peekskill, New York, to compete with the Hudson River Telephone Company.

James I. Gemmill, who was instrumental in organizing the Gemmill Telephone & Manufacturing Company of Cleveland, Ohio, has sold his stock in the company to Alexander Grosset and George T. Dunlap of New York.

F. W. Kelsey of Spokane, Washington, has accepted the managership of the Pendleton, Oregon, telephone exchange, succeeding Miss Claire Houssu, who resigned as local manager after having acted in that capacity for seven years.

Arthur Beardsley and Charles Ostrander have sold to the Danby Telephone Company at West Danby, New York, all the lines, telephones and switchboards which have been in their possession in connection with the Independent system at Danby.

R. A. Walker, who for five years past has been in charge of the maintenance department of the Mutual Telephone Company at Des Moines, Iowa, has accepted the position of general manager of the Central Iowa Telephone Company, at Iowa Falls, Iowa.

R. L. Parker of Gladbrook, Iowa, has completed a deal for the purchase of the entire Traer exchange and adjacent lines, which is a portion of the United States Telephone and Telegraph Company's system. Mr. Parker is the owner of the system at Gladbrook.

A. L. Tetu, formerly general manager of the Louisville (Ky.) Home Telephone Company, who recently went to Nashville, Tennessee, to become general manager of the Home Telephone Company of that city, has opened up offices at 67 and 69 Cole building.

H. C. Mock, well known in the Independent manufacturing field, has taken a position as traveling salesman with the Williams-Abbott Electric Company of Cleveland, Ohio, his territory comprising several of the northwestern states and extending into the Puget Sound country.

Edward E. Webster, manager of the Independent Telephone Company of Seattle, Washington, is planning a long-distance telephone line which will surpass anything on the west coast, with plants in Tacoma, Everett, Olympia, Bellingham, Port Townsend and other smaller cities.

P. Kerr Higgins, well known in the Independent telephone field and a frequent contributor to the technical journals, has opened an office as consulting engineer at 349 South Figueroa street, Los Angeles, California. Mr. Higgins has had twenty-two years' experience in telephone work.

Fred Ripley, chief lineman for the Black River Telephone Company at Lowville, New York, has removed with his family to Adams, where he will have charge of the Adams exchange of the Black River Telephone Company. A. F. Boardman will succeed Mr. Ripley as chief lineman for the company at Lowville.

R. Nyman of Chicago and Miss Pearl Havers of Carnia, Ontario, were united in marriage at Detroit, April 21. Mr. Nyman, who was formerly with The Telephone Journal and is now connected with the Chicago Nut Company, is well known in telephone circles. He and his bride are at home at 507 Dearborn Avenue, Chicago.

George A. Long, engineer of the Gray Telephone Pay Station Company of Hartford, Connecticut, recently made a business trip to Chicago, and while there concluded arrangements with George W. Conover & Company, purchasing and forwarding agents for Independent telephone companies, making this firm the western agent of the Gray company.

Robert Lewis Ames, who for the past four years has had charge of the patent litigation and the prosecution of patent applications for the Kellogg Switchboard and Supply Company, has recently associated himself as a partner with Jones & Addington, attorneys and counsellors, 810 Title and Trust Building, 100 Washington street, Chicago. He will give his attention to patent law.

J. S. Bellamy, for several years manager of the Mutual Telephone Company at Des Moines, Iowa, has resigned and has gone to Hutchinson, Kansas, to take charge of a line which he established at that place. It is said that he will retain his interest in the Mutual company, remaining as president. C. H. Judson, engineer in charge of construction, has taken Mr. Bellamy's place temporarily.

Col. Busby has appointed W. F. Harter of Houston, Texas, as superintendent of the new telephone company at South McAlester, Indian Territory. Mr. Harter is a man of wide experience in the telephone business, having put in the underground work and installed the telephone system at the World's Fair at St. Louis, and was superintendent of the entire system. He has looked over the field at South McAlester, and says he will have an entire new plant in operation by July 15.

John M. Mack, who has been president of the Keystone Telephone Company of Philadelphia since its organization five years ago, has tendered his resignation, giving as his reason that his time was fully occupied with other cares. The resignation was accepted and Jacob E. Ridgway was chosen to fill the vacancy. Mr. Ridgway is president of the Quaker City National Bank and is a well-known capitalist. He has been a member of the Board of Directors of the Keystone company for a number of years.

Samuel G. McMeen, the widely known telephone engineer, delivered an address May 8 at the Armour Institute of Technology, Chicago, before the student branch of the American Institute of Electrical Engineers. Mr. McMeen's subject, "Telephone Engineering," proved very interesting and instructive, and the young engineers gained a very good idea of the requirements of an up-to-date telephone engineer. Many of the young men expressed their intentions of entering this field of work next fall, and it is presumed that, as a result, the telephone classes will be considerably increased.

Incorporations of the Month

ALABAMA.

ASHLAND—The Clay County Telephone Company. Capital stock, $8,000. Incorporators, Thomas Northern and others.

CALIFORNIA.

SAN FRANCISCO—Articles of incorporation of the Home Telephone Company have been filed with the county clerk. Application for a franchise will be filed within a month, and as soon as that is granted the work of construction will begin. The capital stock is $10,000,000, of which $75,000 has been subscribed by the seven directors. The directors are as follows: Henry T. Scott, John J. Mahony, Mark L. Gerstle, Vanderlynn Stow, and Richard H. Hoteling of this city, J. S. Torrance of Pasadena and Thomas W. Phillips of Los Angeles.

CANADA.

NEW LISKEARD, ONT.—The Temiskaming Telephone Company. Capital stock, $25,000.

CAMPOBELLO, N. B.—The Campobello Island Telephone Company. Capital stock, $2,000. Incorporators, W. E. Ludlow, James Brown, J. W. Mathews, Campobello.

HAILEYBURY, ONT.—The Haileybury and Cobalt Telephone Company has been incorporated with a capital stock of $5,000. The directors are: H. McQuarrie, T. J. Gorman, P. A. Cobbold, C. G. Farr, D. Myles, J. F. Gillies of Haileybury.

IDAHO.

MEADOWS—The Meadows-Warren-Roosevelt Telephone Company. Capital stock, $20,000. President, Thomas B. Snyder; vice-president, F. M. Hubbard; secretary, W. E. Webb; treasurer, A. R. Krigbaum.

ILLINOIS.

ULLIN.—The Ullin Telephone Company. Capital stock $2,500. Incorporators, F. H. Holcomb, J. B. Mathis, W. W. Miller.

ODELL—The Odell Telephone Company. Capital stock, $2,500. Incorporators, George Desvoigne, I. E. Desvoigne, A. Desvoigne.

COWDEN—Cowden Mutual Telephone Company. Capital stock, $2,500. Incorporators, S. Hodson, Frank B. Bunn, James C. Hodson.

ORION—The Orion Telephone Exchange Association. Capital stock, $2,500. Incorporators: F. L. Anderson, F. O. Swanson, N. A. Eckstadt.

LEXINGTON—The Lexington Home Telephone Company. Capital stock, $20,000. Incorporators, L. F. Hyneman, H. Van Gundy, William Edwards.

MOUNT PLEASANT—The Mount Pleasant Telephone Company. Capital stock, $10,000. Incorporators, S. C. Stout, U. G. Ragsdale, James F. Dick.

MONMOUTH—The Rural Telephone Construction Company. Capital stock, $2,000. Incorporators, J. E. Lamphere, W. J. McQuiston, Reimer Lahann.

PINCKNEYVILLE—The Pinckneyville Telephone Company. Capital stock, $4,200. Incorporators, W. E. McCandless, Geo. Pillers, George F. Mead.

ROUND KNOB—The Massa County Mutual Telephone Company. Capital stock, $2,490. Incorporators, George Verbarg, Christ Korte, Charles S. Adkins.

MASCOUTAH.—The Looking Glass Prairie Telephone Company. Capital stock $2,500. Incorporators, Henry V. Liebig, Fred J. Graul, Adam J. Fried.

INDIANA.

ST. WENDELLS—The St. Wendel Telephone Company. Capital stock $525.

OSGOOD—The Osgood Telephone Company. Capital stock, $5,000. Secretary and business manager, George Ashman.

BERN—The Union Telephone Company. Capital stock $3,000. Directors, J. S. Mason, R. B. Kerr, Samuel Tellen.

MILTON—Milton Co-operative Telephone Company. Capital stock $10,000. Incorporators, L. W. Beeson, W. E. Williams, W. A. Bragg, W. I. Doddridge.

ST. BERNICE—The Citizens' Mutual Telephone Company. Capital stock, $400. Incorporators, J. T. Newton, J. P. Hartsock, A. M. Reed, H. M. Nolan, V. F. Houston.

NEW SALEM—The New Salem Telephone Company. Capital stock, $5,000. Incorporators, William P. King, John O. Williams, C. M. George, H. V. Logan, M. L. Stewart.

IOWA.

EXLINE—The Exline Mutual Telephone Company.

CALLENDER—The Callender Mutual Telephone Company.

EAST PERU—The Peru Telephone Company. Capital stock, $4,000.

GOWRIE—The Lena-Gowrie Telephone Company. Capital stock, $15,000.

MODALE—The Interstate Telephone Company. Capital stock, $50,000. President, W. H. Smith.

LAMONI—The Lamoni Telephone Company. Capital stock, $25,000. Incorporators, W. A. Hopkins and others.

MOULTON—The Farmers' Mutual Telephone System. Capital stock, $1,000. S. H. Jordan and others incorporators.

GRISWOLD—The Ronk & Conklin Telephone Company. Capital stock, $10,000. Incorporators, F. M. Ronk and others.

REINBECK—The Black Hawk and Grant Township Telephone Company. Fred Schreiber, and others, incorporators.

PRIMROSE—The Northwestern Telephone Company. Capital stock, $20,000. Incorporators, L. H. Browlee and others.

MASSENA—The Massena Independent Telephone Company. Capital stock $10,000. Incorporators: George J. Austen and others.

GRAND MOUND.—The German Mutual Telephone Company. Capital Stock, $6,900. President, Theo. Peckenchneider; vice-president, John Greve; secretary, P. H. Blunk; treasurer, Gustav Ahiff.

BUFFALO CENTER—The Buffalo Township Telephone Company. Capital stock, $6,000. President, A. Bolsinger; vice-president, B. F. Drake; secretary and treasurer, J. J. Guyer; directors, Geo. J. Andrews, A. C. Olson, A. Winkleman, F. A. Kayser, and the above officers.

ELKADER—The Communia Telephone Company. Capital stock, $1,500, divided into shares of $30 each. President, H. D. Cords; vice-president, George Meyer, Jr.; secretary, J. W. Meyer; treasurer, John W. Meyer; directors, H. D. Cords, J. W. Meyer, Jansey Tieden, Louis Lemke, Frank Tieden.

KANSAS.

READING—The Reading Independent Telephone Company.

ST. JOHN—The Cleveland Telephone Company. Capital stock, $4,000.

HAZELTON—The Barber Telephone Company. Capital stock, $5,000.

BURR OAK—The Red Line Mutual Telephone Company. Capital stock $3,500.

DANVILLE—The Danville Rural Telephone Company. Capital stock, $5,000.

YORKTOWN—The Yorktown Mutual Telephone Company. Capital stock, $6,000.

WINFIELD—The Cowley County Telephone Company. Capital stock, $10,000.

ROBINSON—The Robinson Mutual Telephone Company. Capital stock, $10,000.

HUNNEWELL—The Oklahoma Northern Mutual Telephone Company. Capital stock, $1,000. Incorporators, J. W. Thompson, E. E. Tibbits, A. C. Treat.

PLAINVILLE—The Plainville Telephone Company. Capital stock, $12,000. Incorporators, C. G. Cochran, C. H. Goodman, C. N. Burroughs, O. A. Lemon, P. D. Spellman, C. W. Brown.

BAVARIA—The Bavaria Farmers' Telephone Company has been organized at this place with the following officers: President, C. E. Joslin; secretary, Ben Veltman; treasurer, Edward Yocker. The company will connect with the Salina and Salemsburg exchange.

KENTUCKY.

HANKS—The Hanks and Folsom Telephone Company. Capital stock, $500.

SULLIVAN—The Sullivan Telephone Company. Capital stock, $250. President, J. J. Martin; vice-president, T. E. Hammack; secretary, T. B. Quirey; treasurer, A. R. Hammack.

MAINE.

PORTLAND—The Champlain Valley Telephone Company has been organized in this city for the purpose of constructing, owning, maintaining, and operating telephone and telegraph lines in other states than Maine. Capital stock, $150,000. The officers are as follows: President, F. W. Story, Boston, Mass.; treasurer, Charles H. Adams, Portland.

MARYLAND.

MARYDELL—The Marydell and Templeville Telephone Company. President, H. S. Daily.

MASSACHUSETTS.

BOSTON—The National Telephone Holder Company. Capital stock, $40,000. Incorporators, Fred A. Ewell, H. B. Mitchell, Charles F. David.

MICHIGAN.

SAGOLA.—The Sagola Telephone Company. Capital stock, $400.

POTTERVILLE.—The Grand River Telephone Company. Capital stock $3,000.

GRAND RAPIDS—The Grand River Telephone Company. Capital stock, $3,000.

GRAND BLANC.—The Grand Blanc Telephone Company. Capital stock $4,000.

MINNESOTA.

MARIETTA—The Marietta Telephone Company. Capital stock $10,000.

SLEEPY EYE—The Sleepy Eye Telephone Company. Capital stock, $15,000. President, J. M. Olsen; vice-president, Charles P. Cutting; secretary, William Brust; treasurer, A. A. Larrabee.

BIG LAKE—The Sherburne County Rural Telephone Company. Capital stock, $50,000. Incorporators, John M. Haven, Jesse A. Gutzler, J. C. Jacobson, Charles F. Knapp, George Patterson.

COMFREY—The Comfrey Rural Telephone Company. Capital stock, $25,000. President, J. A. Prim; vice-president, L. P. Richardson; secretary, C. L. Lunkersmith; treasurer, Oscar Erickson.

WALKER—The Walker Telephone Company. Capital stock, $50,000. President, E. I. P. Staede; vice president, Chas. Kinkele; secretary, C. E. Griffith; directors, Geo. E. Crow and Daniel DeLury.

GLENVILLE—The Freeborn County Rural Telephone Company. Capital stock, $10,000. Incorporators, A. W. Trow, Martin Moe, S. P. Nelson, A. S. Budlong, N. P. Nelson, W. S. Palmer, Walter Knutson, Fred Will.

MISSISSIPPI.

EUPORA—The Co-operative Telephone and Telegraph Company. Capital stock, $5,000.

MISSOURI.

MAXWELL—The Maxwell Telephone Company. Capital stock $1,000.

BLUE SPRINGS—The Blue Springs Telephone Company. Capital stock, $10,000. President, Roy C. DeAtley; secretary, Thomas J. Parker; treasurer, Minnie C. DeAtley.

MOUNT VERNON—The Lawrence County Mutual Telephone Company. Capital stock, $10,000. Incorporators, J. J. Lester, F. M. Howard, Norman Smith, A. McQuality, W. T. Swearengin, Fannie Wilder, Charles Hillhouse, L. Jeffords, and others.

MONTANA.

ANACONDA—The Anaconda and Big Hole Telephone Company. President, W. R. Allen; secretary, George Wellcome.

CHINOOK—The Milk River Telephone Company. Capital stock $5,000. Incorporators, O. W. Harris, R. E. O'Keefe, H. Greenberg.

DILLON.—Articles of incorporation for the Southern Montana Telephone Company have been drawn up with the following as incorporators: B. F. White, A. L. Stone, Frank A. Hazelbaker of Dillon, George Woodworth and Herman Jackson. Capital stock $5,000. The board of trustees elected to serve the first three months are: B. F. White, A. L. Stone, M. L. Davidson, F. A. Hazelbaker, Edwin Norris, Geo. Woodworth, Chauncey Brown, C. H. Strowbridge, Herman Jackson. The line will be constructed at once.

NEBRASKA.

COZAD—The Midway Mutual Telephone Company.

FIRTH—The Firth Telephone Company. Capital stock authorized, $10,000.

REYNOLDS—The Reynolds Telephone Company. Incorporators, G. A. Rogers and others.

LOUP CITY—The Sherman County Telephone Company. Capital stock, $50,000, $12,500 of which is paid up.

ALBION—The Albion-Loretta Telephone Company. Capital stock, $5,000. Among the incorporators are W. F. Riley and F. F. Willott.

PLEASANTDALE—The Union Telephone Company, capital stock $5,000, has filed articles of incorporation with the secretary of state.

PLEASANTDALE—The Pleasantdale Telephone Company. Capital stock, $10,000. Incorporators, W. Cody, C. H. Oxley, E. Courtwright, F. C. Finke, G. Finke, and C. Mason.

HEBRON—The Hebron Telephone Company. Capital stock, $50,000. Incorporators, G. H. Johnson, J. R. McCann, of Beatrice; C. W. Ribble, of DeWitt; A. S. Sands, of Wilber; W. G. Francis, W. E. Goodhue, W. A. Lockwood, of Hebron.

NEW YORK.

SCIO—The Vandermark Telephone Company. Capital stock, $1,200. Directors, T. C. Kane, R. V. Gillett, D. J. Gillett, Scio.

STERLING—The Ne-ah-ga Telephone Company. Capital stock $1,500. Directors, J. R. Ingersoll, W. R. Andrews, L. S. Frolick, all of Sterling.

POPLAR RIDGE—The Southern Cayuga Telephone Company. Capital stock $15,000. Incorporators, Isaac P. Hazard, Charles Pyle, Isaac P. Hazard, Jr.

ALBANY—Albany Telephone & Telegraph Company. Capital stock $3,000. President, A. G. Bean; treasurer, L. J. Andrews; clerk, A. L. Bean, all of Albany.

ONEONTA—The Home Telephone Company. Capital stock, $50,000. Incorporators, Walter L. Brown, Arthur W. Cutler, Malcolm G. Keenan, and others of Oneonta.

OAKS CORNERS—The Oaks Corners Telephone Company. Capital stock, $2,500. Directors, F. E. Hood, Oaks Corners; Stephen A. Smith and Henry Vansickle, Geneva.

GREENE—The Coventry & Greene Telephone Company. Capital stock, $1,000. Directors, Dr. George O. Williams, Dr. Frank Burton of Greene; and Matthew F. Smith, Frank B. Willoughby, Frank Brachler, Jerome Watrous and William Wiley of Coventry.

MALONE—The Adirondack Home Telephone Company. Capital stock, $150,000. The directors for the first year are as follows: Howard Hendrickson, Henry M. Keyes, Frank E. Griffin, William B. Harris, H. J. Diekman, and C. J. Crummey, all of Albany.

FULTON—The Volney Telephone Company. Capital stock $500. President, Dr. Robert Simpson, Jr.; vice-president, C. E. Sackett; secretary, Eugene Row; treasurer, E. E. Hart; directors, Robert Simpson, Eugene Row, H. B. Tice, J. S. Moss and C. E. Sackett.

MIDDLETOWN—The Middletown Telephone Company was incorporated May 15 and the board of directors met on May 16 and elected the following officers: President, Dr. M. C. Conner; vice-president, Dr. Edwin Fancher; treasurer, Luther W. Post; secretary, W. C. Ramsdell.

NORTH CAROLINA.

WASHINGTON—The Hyde County Telephone Company. Capital stock, $25,000. Incorporators, H. Susman, B. L. Susman, C. E. Harding.

MT. GILEAD.—The Mt. Gilead Telephone & Electric Light Company. Capital stock, $25,000. Incorporators, J. R. Blair, A. H. Ragan, E. M. Harris.

NORTH DAKOTA.

SOURIS—The Farmers' Mutual Telephone Company. Capital stock, $20,000.

CATHAY—The Cathay Telephone Company. Incorporators, A. R. Jossond, O. A. Bredo, John Seibold, all of Cathay.

KINER.—The Bremen Telephone Company. Incorporators, John N. Lies, Matt Endres, Kiner; Gottleib Bettger, Twist, N. D.

GRANVILLE—The Union Telephone & Light Company. Capital stock $5,000. Incorporators, Oliver G. Nordmarken, Josiah H. Davies.

WHEATLAND—The Wheatland Telephone Exchange. Capital stock, $15,000. Incorporators, E. Q. Powlison, B. H. Powlison, J. W. Mitchell, all of Wheatland.

MARION—The La Moure County Telephone Company. Capital stock, $3,000. Incorporators, Wesley C. McDowell, John C. Ardenser, Christ Baertsch, Marion, N. D.

DICKINSON.—The Dakota Telephone Company. Capital stock $20,000. Incorporators, W. P. Owen, W. G. Whinn, A. N. Jefferies, W. L. Richards, Geo. M. Frye, all of Dickinson.

WILLISTON—The Great Northern Telephone Company. Capital stock, $50,000. Incorporators, J. J. Delaney, H. C. Delaney, L. H. Dow of Williston, N. D., and George Dow of Madison, Wis.

SHEYENNE—The Sheyenne Telephone Exchange Company. Capital stock, $1,000. Incorporators, J. W. Richter, L. G. Severtson, L. B. Garnaas, A. H. Johnson, J. N. Lundberg, E. P. Westerlund, and others.

OHIO.

CHERRY VALLEY—The Cherry Valley Telephone Company. Capital stock, $3,000.

BURLINGTON—The Burlington Telephone Company. Capital stock $300. C. L. Crawford and others are interested.

VAN WERT—The Ridge Telephone Company. Capital stock, $275. Incorporators, Jacob Binkler, J. D. Tussing, Jeremiah East, J. W. East.

TAPPAN—The Tappan Telephone Company. Capital stock, $1,300. Incorporators, C. B. Spray, F. H. Sampson, D. C. Taylor, and others.

ATHENS—The Athens County Telephone Company. Capital stock, $100,000. Incorporators, W. E. Peters, J. E. Williams, H. D. Henry, H. W. McKinstry, A. E. Ayers.

RINGGOLD—The Corning-Elliott Telephone Company. Capital stock, $5,000. Incorporators, Elmer W. Gladden, Owen Gladden, F. H. Johnson, E. A. Gladden, J. W. Davis.

BROOKVILLE—The United Home Telephone Company. Capital stock, $75,000. Incorporators, N. W. Rinehart, A. M. Meyers, J. G. Kuns, S. A. Blessing, O. E. Baker, H. B. Marshall.

TOLEDO—The American Telephone Construction Company. Cap-

ital stock, $100,000. Incorporators, C. F. Chapman, Jr., E. H. Winkworth, F. W. Coughling, W. B. Luck, J. R. Kienfer.

OKLAHOMA.

KENTON.—The Kenton Telephone Company.

KAW CITY—The United Telephone Company. Capital stock, $25,000. Incorporators, D. W. Campbell of Fairfax, R. L. Bristow and C. Bristow of Kaw City.

PERRY—The Longview Telephone Company. Capital stock $10,000. The stockholders are as follows: B. J. Tucker, of Orlando; M. Jerome of Orlando, and J. A. Abraham, of Perry.

GAGE—The Gage Telephone Company, for a period of twenty years. Capital stock, $5,000. Incorporators, G. E. Irwin, R. J. Bishop, J. L. Pryor, E. Leonard, R. D. Cole, H. Holmes.

KENTON—The Kenton Telephone Company. Capital stock $2,500. Incorporators: John W. Turner, F. D. Drew, A. W. Turner, J. J. Ballard, D. K. Lord, Henry Beerly, L. A. Wikoff and a Mr. Tanner, all of Kenton.

GRANTON—The Granton, Fairview and Western Telephone Company. Capital stock, $5,000. Incorporators, J. C. Major, W. J. Scates, and E. Benbow of Granton, S. S. Davidson and E. J. Davidson of Roscoe.

OREGON.

DAIRY—The Spring Valley Telephone Company. Capital stock, $4,000. Incorporators, C. W. Sherman, Jr., W. L. Welch, and others.

LAKEVIEW—The Dent Telephone and Telegraph Company. Capital stock, $3,000. Incorporators, F. M. Miller, C. W. Dent, Harry Bailey.

PENDLETON—The Cold Springs Telephone Company. Capital stock $2,000. Incorporators, T. B. Hampton, D. E. Cargill, Henry Lorenzen.

WALDPORT—The Waldport Mutual Telephone Company. Capital stock, $250. Incorporators, E. Goin, J. W. Walker, J. H. Glines, Claus Ludemann, James Kent, David Ruble.

PENNSYLVANIA.

REITZ—The Central Telephone Company. Capital stock $5,000.

HONESDALE—The Lackawaxen & Hawley Telephone Company. Capital stock $5,000.

PITTSBURG—A certificate of incorporation has been filed at Dover, Delaware, for the Gault Drum Telephone Company of Pittsburg. Capital stock, $100,000. Incorporators, C. D. John and H. P. Rawley, Pittsburg; H. B. Mosser, Aspinwall, Pa.

BENTON—The Benton Mutual Telephone Company has been organized. President, Harvey W. Hess; vice-president, C. E. Yorks; secretary, Torrence C. Smith; treasurer, M. A. Phillips; directors, M. O. Everhart, Thomas Edwards, V. A. Buck, Oscar Ammerman, A. L. Fritz.

SOUTH DAKOTA

BONESTEEL—The Gregory Home Telephone Company. Capital stock, $25,000. Incorporators, S. F. Lucas, George A. Jeffers, Fred Riechman, A. E. Schael, S. M. Lindley.

TENNESSEE.

NASHVILLE—The Central Telephone Company of Fentress County. Capital stock, $10,000.

NASHVILLE—Articles of incorporation have been filed for the Farmers' Union Telephone Company. Capital stock, $480. Incorporators, L. Bland, Allie Williams, E. W. Smith, R. J. Latton, and I. D. Young. Headquarters not given.

TEXAS.

PILOT POINT—The Pilot Point Telephone Company. Capital stock, $4,000.

ELGIN.—The Elgin Automatic Telephone Company. Capital stock $10,000. Incoroprators, C. L. St. Clair, C. W. Webb, R. E. Weir, all of Elgin.

UTAH.

SALT LAKE CITY—Articles of incorporation of the Bear River Valley Telephone Company have been filed with the secretary of state. Capital stock, $25,000. The headquarters of the company are at Tremonton.

WISCONSIN.

GREENWOOD—The Greenwood Telephone Company.

UNION GROVE—The North Cape Telephone Company will extend its lines in the near future.

LOYAL—The Beaver Telephone Company. Capital stock, $400. Incorporators, B. F. Frasier, D. A. Irvine, F. M. Darton.

OCONOMOWOC—The Badger Telephone Company. Capital stock, $2,000. Incorporators, Thomas Steele, J. J. Reid, Harry Rose.

CEDAR GROVE—The Cedar Grove Telephone Company. Capital stock, $3,000. Incorporators, Adrian Fonteine, J. W. Meinen, Gustave Zimmerman.

HIGHLAND—The Social Ridge Telephone Company. Capital stock, $800. Incorporators, John Wepking, Walter Wall, Thomas Wall, and others.

MANITOWOC—Papers have been filed incorporating the Jerpen and Valders Telephone Company, which will operate in the county, especially in the town of Liberty. Capital stock, $1,500. Incorporators, Otto Berge, Nels Nelson, N. T. Norstad.

ANNUAL MEETINGS.

CALIFORNIA.

SARATOGA—At the annual meeting of the Saratoga Telephone Company the following officers were elected: President and manager, Ralph A. Husted; secretary, James T. Richards; treasurer, Dr. R. L. Hogg; directors, J. M. Lipscomb, W. G. Tomlinson.

CANADA.

WHITEVALE, ONT.—At a meeting of the Markham & Pickering Telephone Company the following officers were elected: President, Alf. Hoover; vice-president, A. C. Reesor; secretary-treasurer, D. R. Beaton; directors, A. F. Wilson, Dr. G. N. Fish, F. L. Gleason, Thomas Beare.

ILLINOIS.

PRINCETON—The stockholders of the Bureau County Independent Telephone Company held their annual meeting at this place and elected the following officers: President, Dr. A. E. Owens; vice-president, A. Dunbar; secretary and general manager, C. O. White; treasurer, A. H. Ferris; directors, J. W. Ross, Dr. W. H. Blackburn, Aaron Dunbar.

INDIANA.

INDIANAPOLIS—At the annual meeting of the stockholders of the New Long Distance Telephone Company the following officers and directors were elected: President, S. P. Sheerin; vice-president, A. F. Ramsey; secretary and treasurer, H. B. Sale; Louis Hollweg, W. H. Hollowell, Louis Reese, J. W. Weik.

IOWA.

FAIRFIELD—The Jefferson County Telephone Company has elected the following officers: President, J. C. Thorne; secretary and treasurer, Frank Light; vice-president, Ed Hunt.

CASTANA.—The Castana Mutual Telephone Association recently held its fourth annual meeting and elected officers as follows: President, John S. Ordway; vice-president, C. T. Hansen; secretary, W. H. Kennedy; treasurer, W. H. Waples, Jr.

NEWTON—The stockholders of the Jasper County Telephone Company recently held their annual meeting at this place and elected officers as follows: President, A. H. Bergman; secretary, H. C. Korf; treasurer, C. Griebeling; manager, R. S. Redman; directors, A. H. Bergman, J. R. Skinner, T. C. Russell, H. C. Korf, F. M. Taylor.

KANSAS.

OSWEGO—The Labette County Telephone Company recently elected officers as follows: President, D. S. Romine; vice-president, J. H. Rust; treasurer, Fred Perkins; secretary, J. M. Rings; purchasing agent and manager, G. H. Spangle; directors, Sig Lehman and A. D. Neale, Chetopa; Fred Perkins, Oswego; D. S. Romine, I. M. Hinds, R. B. Williams, George Pfaff, B. F. Bouton, Edna Rust, J. H. Rust.

MARYLAND.

MECHANICSVILLE—The stockholders of the Southern Maryland Telephone Company recently met at this place and elected officers as follows: President, J. F. Coad; secretary and treasurer, L. J. Canter; directors, Zacariah R. Morgan, George M. Thomas.

MINNESOTA.

ALBERT LEA.—The directors of the Albert Lea Telephone Company at a recent meeting elected officers as follows: President, S. Strauss; vice-president, C. F. Towne; secretary and manager, G. W. Johnson; treasurer, D. C. Armstrong.

SHAKOPEE—At the annual meeting of the directors of the Shakopee Telephone Company the following officers were elected: President, J. B. Ries; vice-president, Peter V. Philip; secretary and treasurer, Dr. H. P. Fischer; directors, Rev. Alois Plut, Chas. Groshauser, M. A. Deutsch, and the above officers.

MISSOURI.

HANNIBAL.—The directors of the Miller Township and Hannibal Telephone Company have elected the following officers: President, George W. Pine; vice-president, H. C. Whaley; secretary and treasurer, L. E. Frazier.

RICHMOND—The stockholders of the Polo and Richmond Telephone Company held their annual meeting at this place and elected the following officers for the ensuing year: President and manager,

D. A. Kelmel; secretary and treasurer, G. E. Higdon; directors, S. L. Clevenger, Jas. C. Crowley, Van Wall.

NEBRASKA.

NELSON—The Nuckolls County Telephone Company held its first annual meeting at this place and elected the following directors for the coming year: S. A. Lapp, J. C. Day, John Chamberlain, B. F. Scroggen, J. A. Wehrman, W. A. Voigt, J. R. Parsons.

NEW JERSEY.

SUSSEX—The Farmers' Telephone Company held its annual meeting at this place and re-elected the old officers as follows: President, Warren D. Haggerty; secreary, Frank Armstrong; treasurer, William Ayers.

SUSSEX.—The Farmers' Union Telephone Company of Sussex County has elected the following officers for the ensuing year: President, W. D. Haggerty; vice-president, Raymond Courson; secretary, F. E. Armstrong; treasurer, William Ayers; directors, C. J. Stannaback, Joseph Ayres, Irving Brink and the above named officers.

NEW YORK.

FRIENDSHIP—At the annual meeting of the Friendship Telephone Company officers were elected as follows: President, James T. Ward; vice-president, Guy Wellman; treasurer, H. F. Wells; secretary, W. C. Kingsbury; general manager, C. S. Lane.

SCHENECTADY—The Home Telephone Company recently held its annual meeting and elected officers as follows for the ensuing year: President, Charles E. Veeder; vice-president, Irving H. Griswold; secretary, Sam M. Strong; treasurer, Evans S. Kellogg; directors, Homer Strong, J. W. Smitley.

AMSTERDAM—The Automatic Telephone Company held its annual meeting and elected the following directors: Willis Wendell, James T. Sugden, John K. Stewart, William B. Charles, A. W. Breedon, Louis E. Harrower, Samuel Wallin, Archie R. Conover, Burton Fisher, George McClumpha, Daniel Ostrom.

WARWICK—At the annual meeting of the Warwick Valley Telephone Company the following directors were elected: W. A. Hynard, W. E. Bailey, F. M. Cummins. The report of the treasurer showed the company to be in good condition financially. It was voted that no dividends be declared until the debts of the company are discharged.

MANCHESTER—The annual meeting of the stockholders of the Red Jacket Telephone Company was held in this place and officers elected as follows: President, Carlos P. Osgood; vice-president, Robert B. Peck; secretary, Willis C. Ellis; treasurer, Oliver S. Titus; directors, John H. Pratt, Carlos P. Osgood, and Daisy M. Osgood of Manchester, William H. Burke of Clifton Springs, Willis C. Ellis, Oliver S. Titus, and Robert B. Peck of Shortsville.

ALBANY—The annual meeting of the stockholders of the Albany Home Telephone Company was held at Elyria, Ohio, recently, and the following officers elected for the coming year: President, Howard Hendrickson; vice-president, Irving H. Griswold; treasurer, George C. Lee, Jr.; secretary, Henry J. Prince, Jr.; directors, James Moore, Henry Dumary, William H. Keeler, Albert Hessberg, E. B. Teedt, Howard Hendrickson, Eli M. Woodward, George C. Lee, Jr., Richard Stephens, Albany; Samuel B. Rawson, Irving H. Griswold, Theodore M. Brush, Frederick Sucro, W. F. Brooks, E. E. Williams, Elyria, O.

OHIO.

WOODSFIELD—At the recent meeting of the Woodsfield Telephone Company the following officers were elected: President and general manager, Dr. F. C. Huth; vice-president, William Simmons; secretary and treasurer, C. H. Dew; assistant secretary and treasurer, Miss Frances Haren.

WAYNESFIELD—The stockholders of the Auglaize Telephone Company held their annual meeting at this place and elected the following officers: President, R. T. Means; secretary and manager, Jesse Bowdle; directors, R. T. Means, Jesse Bowdle, W. H. Hutvher, Dr. W. S. Turner, Frank Day.

ASHTABULA—The Ashtabula Telephone Company held its annual meeting recently and re-elected officers as follows for the coming year: President, P. O. Remick; vice-president, W. R. Flower; secretary, S. W. Crosby; treasurer, B. B. Seymour; directors, E. E. Beam, F. E. Henry, V. D. Latimer, J. A. Paisley, W. H. Morrison, B. B. Seymour, S. W. Crosby, W. R. Flower, P. O. Remick.

OKLAHOMA.

GUTHRIE—The stockholders of the Pioneer Telephone and Telegraph Company at a recent meeting elected the following officers: President, E. D. Nims, Muscogee; vice-president and general manager, J. M. Noble, Oklahoma City; secretary and treasurer, E. E. Westervelt, Oklahoma City; directors, E. D. Nims, John M. Noble, E. E. Westervelt, James F. Noble, David McKinstry, Davis Hill, H. E. Asp.

EL RENO—At the annual meeting of the Topeka & El Reno Telephone Company recently held in this city the old officers were re-elected as follows: President, C. O. Blake; vice-president, W. F. Evans, St. Louis; treasurer, F. H. Wright; secretary, George W. Bellamy; directors, M. A. Low, Topeka; Wm. Grimes, Guthrie; H. B. Johnson, Chickasha; W. F. Evans, C. O. Blake, H. T. Smith, F. H. Wright, R. S. Trulock, George W. Bellamy.

OREGON.

MONMOUTH—The Luckiamute Rural Telephone Company has elected the following officers for the ensuing year: President, Mayor J. H. Hawley; vice-president, James Helmich; secretary, J. J. Thurston; directors, J. H. Hawley, J. A. Withrow, J. J. Thurston, W. E. Williams, James Helmich.

PENNSYLVANIA.

BLOSERVILLE—The Bloserville Telephone Company has elected officers as follows: President, J. S. Darr; vice-president, C. H. Leib; secretary, A. H. Calaman; treasurer, H. E. Buckwalter.

MEEKER—The Lake & Lehman Telephone Company of this place has elected the following officers: President, Charles Bronson; vice-president, F. Wilkins; secretary, Wm. Armstrong.

MONTROSE—The stockholders of the Montrose Telephone and Telegraph Company have elected the following officers: President, J. F. Butterfield; secretary, treasurer and general manager, C. L. Stone; directors, M. S. Dessauer, F. I. Lott, E. C. Rogers.

CAMBRIDGE SPRINGS—The annual meeting of the stockholders of the Cambridge Springs Electric Telephone and Telegraph Company was held at the company's offices, and the following officers elected for the ensuing year: President, D. E. Kelly; secretary and manager, C. W. Jones; treasurer, A. H. Matteson; directors, C. W. Jones, D. E. Kelly, Otto Kohler, A. H. Matteson, Fenton C. King.

TEXAS.

ORANGE—The Orange-Newton Telephone Company, recently incorporated, has elected the following officers: President, F. H. Farwell; vice-president, E. W. Brown; secretary, E. R. Webber; treasurer, A. M. H. Stark.

AUSTIN—At the annual meeting of the board of directors of the Texas Telephone and Telegraph Company the following officers were elected: President and general manager, C. C. Gibbs of San Antonio; vice-president, W. R. Hamby of Austin; superintendent, A. G. Miller of Llano.

SHERMAN—The annual meeting of the stockholders of the Grayson County Telephone Company was held in this city recently and the following directors elected for the coming year: W. B. Richie, E. Christen, C. D. Crites, Lima, Ohio; D. W. Jay, St. Marys, Ohio; James K. Duffey, New York; S. W. Porter and C. A. Shock, Sherman.

ORANGE—At the annual meeting of the stockholders of the Orange Telephone Company the following officers were elected: President, E. L. Bruce; vice-president, A. R. Webber; manager, E. R. Webber; directors, E. L. Bruce, A. L. Ford, A. M. H. Stark, R. H. Bruce, E. R. Webber, A. R. Webber, all of Orange; J. W. Burnside and H M. Shingle, Kenton, Ohio.

WISCONSIN.

MUSCODA—The Muscoda Telephone Company has elected the following officers for the ensuing year: President, H. J. Noyes; secretary and treasurer, J. Kaiser.

BELOIT—At the annual meeting of the Beloit Telephone Company the old directors were re-elected and the following officers named: President, M. J. Ward; vice-president, W. H. Grinnell; treasurer, W. M. Brittan.

BLOOMER—At the annual meeting of the Bloomer Telephone Company the following officers were elected for the ensuing year: President, Henry Lebeis; vice-president, P. A. Peterson; secretary E. R. Parker; treasurer, W. E. Kitch.

LA CROSSE—At the annual meeting of the Interstate Telephone Company the following officers were elected: President, James A. Tawney; vice-president, John Dietze; secretary and treasurer, Otto Troost; directors, the above officers and Edw. Lees, J. R. Mitchell, S. L. Wright.

AMHERST—At the annual meeting of the Amherst Telephone Company the following officers were elected: President, Geo. B. Allen; vice-president, C. A. Smith; treasurer, J. O. Foxen; secretary, L. J. Cary; directors, Tom Tronson, H. H. Hoffman and Andrew Howen.

FORT ATKINSON—The stockholders of the Jefferson County Telephone Company recently held their annual meeting at this place and elected officers as follows for the coming year: President, A. M. Webb; vice-president, C. P. Goodrich; secretary, J. N. Hager; treasurer, L. B. Royce; director, G. W. McMillen.

MADISON—At a meeting of the stockholders of the Interurban Telephone Company the following officers were elected: President and manager, Charles Schernecker, Sun Prairie; vice-president, Conrad Engsberg, Lake Mills; secretary and treasurer, A. C. Hoppman, Madison; directors, Henry Schey, George Maloney, North Bristol.

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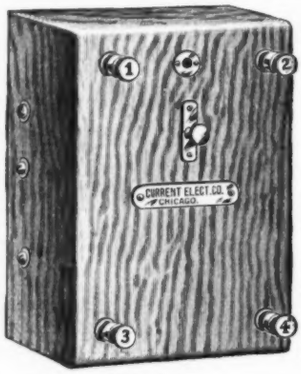

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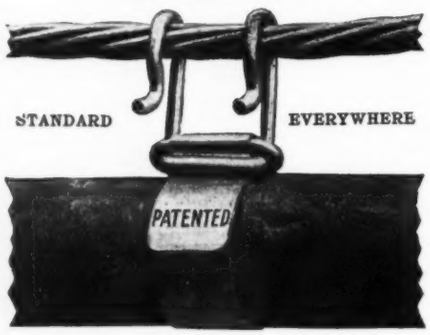

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Arms, Telephone Transmitter.
Baird Mfg. Co., Chicago, Ill.

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Augers.
Iwan Bros., Streator, Ill.

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Books, Telephone.
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Booths, Telephone.
Seaman & Co., W. S., Milwaukee, Wis.

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Okonite Company, New York, N. Y.
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Clamps, Ground.
Yonkers Specialty Co., Yonkers, N. Y.

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Klein & Sons, Mathias, Chicago, Ill.

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Chase-Shawmut Co., Newburyport, Mass.

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Central Tel. & Elec. Co., St. Louis, Mo.
Dean Electric Co., Elyria, O.
Standard Telo. & Elec. Co., Milwaukee, Wis.

Conduit, Underground.
American Conduit Co., Chicago, Ill.
Camp Co., The H. B., New York, N. Y.
McRoy Clay Works, Brazil, Ind.

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Cook, F. B., Chicago, Ill.
Harvard Electric Co., Chicago, Ill.

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General Engineering Co., Chicago, Ill.
Jones & Winter, Chicago, Ill.
Kemp, Roy W., Wellington, Kas.
Miller & McMeen, Chicago, Ill.
Stanton, Leroy W., Cleveland, Ohio.

Condensers, Telephone.
Andrae & Sons Co., Julius, Milwaukee, Wis.
Dean Elec. Co., Elyria, O.
Electric Appliance Co., Chicago, Ill.
Standard Telo. & Elec. Co., Milwaukee, Wis.

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Runzel-Lenz Elec. Mfg. Co., Chicago, Ill.

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Baird Mfg. Co., Chicago, Ill.
Veeder Manufacturing Co., Hartford, Conn.

Creosoting Works.
International Creosoting & Construction Co., Galveston, Texas.

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Nagel Electric Co., W. G., Toledo, Ohio.

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Duplexers.
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Current Elec. Co., Chicago, Ill.
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Spies Electric Co., Chicago, Ill.

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Nagel Electric Co., W. G., Toledo, Ohio.

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Ewing-Merkle Electric Co., St. Louis, Mo.
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Hodge-Walsh Elec. Eng. Co., Kansas City, Mo.
Illinois Electric Co., Chicago, Ill.
Kusel Telo. Mfg. Co., D. A., St. Louis, Mo.
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Monarch Electric & Wire Co., Chicago, Ill.
Mountain State Elec. Co., Wheeling, W. Va.
Nagel Electric Co., W. G., Toledo, Ohio.
North Electric Co., Cleveland, Ohio.
Standard Telo. & Elec. Co., Milwaukee, Wis.
Sterling Electric Co., Lafayette, Ind.
Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
Swedish-American Telephone Co., Chicago, Ill.
Vought-Berger Co., La Crosse, Wis.
Western Electrical Co., Omaha, Neb.
Western Telo. Mfg. Co., Chicago, Ill.
Williams Telephone & Supply Co., Cleveland, O.

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Automatic Electric Co., Chicago, Ill.
Chicago Telephone Supply Co., Elkhart, Ind.
Globe Automatic Telo. Co., Chicago.

Switchboards, Common Battery.
American Electric Telephone Co., Chicago, Ill.
Century Tel. Construction Co., Buffalo, N. Y.
Chicago Telephone Supply Co., Elkhart, Ind.
Dean Electric Co., Elyria, Ohio.
International Telephone Mfg. Co., Chicago, Ill.
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Sterling Electric Co., Lafayette, Ind.
Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
Vought-Berger Co., La Crosse, Wis.
Western Telo. Mfg. Co., Chicago, Ill.

Switchboards, Magneto.
American Electric Telephone Co., Chicago.
Andrae & Sons Co., Julius, Milwaukee, Wis.
Central Tel. & Elec. Co., St. Louis, Mo.
Century Tel. Construction Co., Buffalo, N. Y.
Chicago Telephone Supply Co., Elkhart, Ind.
Dean Electric Co., Elyria, Ohio.
Electric Appliance Co., Chicago, Ill.
Eureka Electric Co., Genoa, Ill.
Farr Tel. & Con. Supply Co., Chicago, Ill.
Gemmill Telephone & Mfg. Co., Orrville, Ohio.
Hipwell Mfg. Co., Allegheny, Pa.
International Telephone Mfg. Co., Chicago, Ill.
Monarch Telephone Mfg. Co., Chicago.
North Electric Co., Cleveland, Ohio.
Standard Tel. & Elec. Co., Milwaukee, Wis.
Sterling Electric Co., Lafayette, Ind.
Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
Swedish-American Telephone Co., Chicago, Ill.
Vought-Berger Co., La Crosse, Wis.
Western Telephone Mfg. Co., Chicago, Ill.
Williams Telephone & Supply Co., Cleveland, O.

Tape.
New York Insulated Wire Co., New York, N. Y.
Standard Underground Cable Co., Pittsburg, Pa.

Telephones, Adjustable.
American Electric Telephone Co., Chicago.

Telephones, Automatic.
Automatic Electric Co., Chicago, Ill.
Chicago Telephone Supply Co., Elkhart, Ind.
Globe Automatic Telo. Co., Chicago.

Telephones, Common Battery.
American Electric Telephone Co., Chicago, Ill.
Century Tel. Construction Co., Buffalo, N. Y.
Chicago Telephone Supply Co., Elkhart, Ind.
Chicago Writing Machine Co., Chicago, Ill.
Dean Electric Co., Elyria, Ohio.
International Telephone Mfg. Co., Chicago, Ill.
Sterling Electric Co., Lafayette, Ind.
Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
Western Telo. Mfg. Co., Chicago, Ill.

Telephones, Lock Out.
Austin & Co., M. B., Chicago.
Baird Mfg. Co., Chicago, Ill.
Nicholas Telephone Selector Co., Rochester, N. Y.

Telephones, Magneto.
American Electric Telephone Co., Chicago, Ill.
Andrae & Sons Co., Julius, Milwaukee, Wis.
Austin & Co., M. B., Chicago, Ill.
Central Electric Co., Chicago, Ill.
Baird Mfg. Co., Chicago, Ill.
Central Tel. & Elec. Co., St. Louis, Mo.
Century Tel. Construction Co., Buffalo, N. Y.
Chicago Telephone Supply Co., Elkhart, Ind.
Chicago Writing Machine Co., Chicago, Ill.
Commercial Elec. Supply Co., St. Louis, Mo.
Dean Electric Co., Elyria, Ohio.
Dearborn Electric Co., Chicago, Ill.
Electric Appliance Co., Chicago, Ill.
Eureka Electric Co., Genoa, Ill.
Ewing-Merkle Electric Co., St. Louis, Mo.
Gemmill Telephone & Mfg. Co., Orrville, Ohio.
Hipwell Mfg. Co., Allegheny, Pa.
Hodge-Walsh Elec. Eng. Co., Kansas City, Mo.
Illinois Electric Co., Chicago, Ill.
International Telephone Mfg. Co., Chicago, Ill.
Kusel Telo. Mfg. Co., D. A., St. Louis, Mo.
Manhattan Electrical Supply Co., Chicago, Ill.
Monarch Telephone Mfg. Co., Chicago.
Mountain State Elec. Co., Wheeling, W. Va.
Nagel Electric Co., W. G., Toledo, Ohio.
North Electric Co., Cleveland, Ohio.
Standard Telo. & Elec. Co., Milwaukee, Wis.
Sterling Electric Co., Lafayette, Ind.
Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
Swedish-American Telephone Co., Chicago, Ill.
Vought-Berger Co., La Crosse, Wis.
Western Telephone Mfg. Co., Chicago, Ill.
Williams Telephone & Supply Co., Cleveland, O.

Telephones, Selective.
Model Electric Co., Burlington, Ia.

Telephone Parts.
American Electric Telephone Co., Chicago, Ill.
Andrae & Sons Co., Julius, Milwaukee, Wis.
Chicago Telephone Supply Co., Elkhart, Ind.
Dean Electric Co., Elyria, Ohio.
Dearborn Electric Co., Chicago, Ill.
Monarch Telephone Mfg. Co., Chicago, Ill.
North Electric Co., Cleveland, Ohio.
Standard Tel. & Elec. Co., Milwaukee, Wis.
Sterling Electric Co., Lafayette, Ind.
Swedish-American Telephone Co., Chicago.
Vought-Berger Co., La Crosse, Wis.
Western Telo. Mfg. Co., Chicago, Ill.
Williams Telephone & Supply Co., Cleveland, O.

Terminals, Cable.
Cook, F. B., Chicago, Ill.

Tools, Construction.
Bissell Co., The F., Toledo, Ohio.
Klein & Sons, Mathias, Chicago, Ill.

Tools, Linemen's.
Klein & Sons, Mathias, Chicago, Ill.

Torches, Blow.
Emmelmann Bros. Mfg. Co., Indianapolis, Ind.

Voltmeters.
Illinois Electric Co., Chicago, Ill.
Weston Electrical Instrument Co., Newark, N. J.

Wire, Copper.
American Electrical Works, Phillipsdale, R. I.
Monarch Elec. & Wire Co., Chicago, Ill.
Plume & Atwood Mfg. Co., Chicago, Ill.
Roebling & Sons Co., John A., Trenton, N. J.
Scovill Mfg. Co., Chicago, Ill.
Standard Underground Cable Co., Pittsburg, Pa.

Wire, Galvanized Iron.
Chicago Telephone Supply Co., Elkhart, Ind.
Crawfordsville Wire & Nail Co., Crawfordsville, Ind.
Indiana Steel & Wire Co., Muncie, Ind.
Monarch Electric & Wire Co., Chicago, Ill.
National Wire Corporation, New York, N. Y.
Roebling's Sons Co., John A., Trenton, N. J.

Wire, Rubber Covered.
Dearborn Electric Co., Chicago, Ill.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Monarch Electric & Wire Co., Chicago, Ill.
New York Insulated Wire Co., New York, N. Y.
Okonite Company, New York, N. Y.
Standard Underground & Cable Co., Pittsburg, Pa.

Wire, Magnet.
Belden Manufacturing Co., Chicago, Ill.
Standard Underground & Cable Co., Pittsburg, Pa.

Wire, Strand.
Crawfordsville Wire & Nail Co., Crawfordsville, Ind.
Monarch Elec. & Wire Co., Chicago, Ill.
National Wire Corporation, New Haven, Conn.
Roebling's Sons Co., John A., Trenton, N. J.
Standard Underground & Cable Co., Pittsburg, Pa.

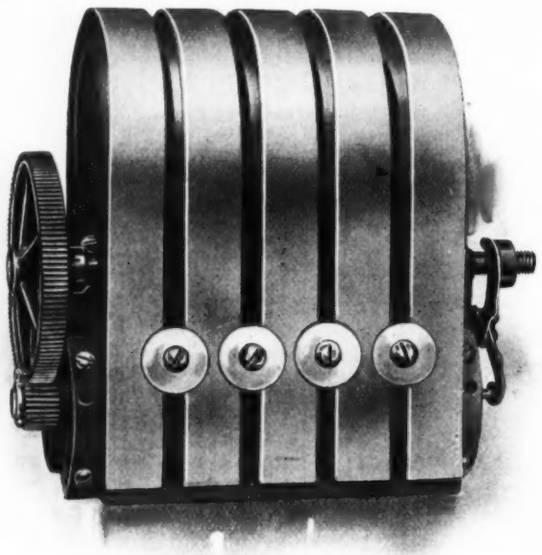
Wire, Telephone Switchboard.
Belden Manufacturing Co., Chicago, Ill.
Runzel-Lenz Elec. Mfg. Co., Chicago, Ill.

Wire, Weatherproof.
Central Electric Co., Chicago, Ill.
Dearborn Electric Co., Chicago, Ill.
Monarch Electric & Wire Co., Chicago, Ill.
Nagel Electric Co., W. G., Toledo, Ohio.
New York Insulated Wire Co., New York, N. Y.
Standard Underground Cable Co., Pittsburg, Pa.

Woodwork.
American Electric Fuse Co., Chicago.
Telephone Woodworking Co., Tiffin, Ohio.

In this little paragraph we have urged and still encourage our thousands of readers to mention TELEPHONY in the letters they write to advertisers. It is a direct compliment to us and there is nothing you can do—except place the order—which will please the advertiser more. There are a great many of our advertisers who use all the telephone papers in which to make their announcements; there are some who use only part of them; and then, there are others who confine all their advertising to TELEPHONY; but this is all the more a reason why you should, when writing to our advertisers, say, "Saw your advertisement in TELEPHONY."

ALL HIPWELL TELEPHONES



are equipped with our new PEERLESS GENERATORS. They are built with the accuracy of a watch and the durability of a plow. ∴ ∴

A Request will bring our new Catalogue.

HIPWELL MFG. CO.
ALLEGHENY, PA.

THE SIMPLICITY
OF OUR
Selective Telephones

not only makes them dividend payers, but keeps the subscribers in better humor. (They will not ring over). Another good feature that appeals especially to the purchaser is the low cost of switchboard equipment and instruments. To prove that we have confidence in the system, for the next 15 days, we will send a sample set, subject to 30 days' approval.

MODEL ELECTRIC CO.
MFRS. OF SELECTIVE, SERIES AND BRIDGING TELEPHONES
204 N. Main St., Burlington, Ia.

General Insulate & Machine Co.
Manufacturers of
SEAMLESS RECEIVER CASES

Mouthpieces — Handles, Knobs

Seamless — Seamless

Quality Unrivaled — Superior Finish

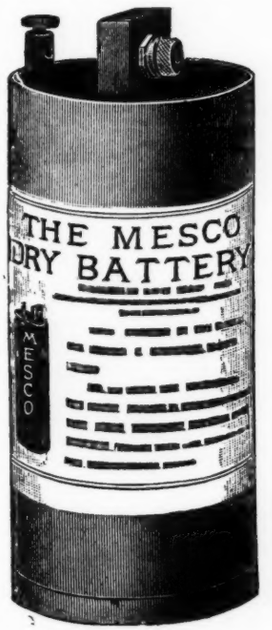
Unexcelled in Mechanical Detail — Highest Grade Material

ALL KINDS OF ELECTRICAL INSULATIONS

GENERAL INSULATE & MACHINE CO.
Factory: Brooklyn, N.Y. — 1214 Chicago Stock Exchange Bldg. Tel. Main 3924. — CHICAGO, ILL.

The Mesco Dry Battery

Is the **best** and **most economical** battery on the market for **telephone service.** Used by the **largest telephone systems** in this country. Prove its merits by giving it a trial.



We manufacture and carry in stock a complete line of **high grade** Telephones and Construction Material.

Shipments prompt. Prices attractive. Write us to-day.

Manhattan Electrical Supply Co.

32 Cortlandt St., New York **188 Fifth Ave., Chicago**

STOP THE LEAKS! | HOW? | WHEN? ! NOW !

By Installing a New, Up-to-Date Accounting and Filing System in Your Exchange

INDEPENDENT LOCAL AND LONG DISTANCE TELEPHONE.

THE Edwards-Hine Co.

Telephone Systematizing Department

Nos. 5 and 7 Pearl Street
GRAND RAPIDS, MICHIGAN, U. S. A.

Telephone Records and Accounting Systems A Specialty

DON'T FAIL TO SEE OUR EXHIBIT AT THE NATIONAL CONVENTION IN CHICAGO, JUNE 20-21-22

Write for Our Special Telephone Catalogue

"Don't Bother the Policeman"

"Tell us your troubles." Mail us a complete set of your Lease Records, Toll and Rental Bills, with all the other forms you are now using. Give us a brief outline of your present methods so that we can formulate and submit a System to Fit Your Business. Do It To-Day.

Our Systems Do Not Mean "Red Tape"
To the Contrary
They are the Trouble Doctors That Kill the "Tape" Worm
of Slack Methods that Eat Up the Profits.
Let Us Prescribe for You
A Simple System to Safe-Guard Your Business and Insure Correct Results.

N. B. Please Mention Telephony

THE STANDARD "HEMINGRAY"

ALL WITH THE "PATENT DRIP PETTICOATS."

THE HEMINGRAY-GLASS CO.

Office, Covington, Ky. **Factory, Muncie, Ind.**

ESTABLISHED 1848

Please tell the Advertiser you saw his Announcement in TELEPHONY.

CENTURY
100 % GOOD

Have you ever used a "Century Platinum Electrode" Transmitter?

If you have not we would like to send you one to try out.

We have spent years in developing this instrument, and a careful test will convince you that the transmitter is nearer perfection than anv you have ever used.

The articulation is perfect, no mechanical or harsh tones. All the peculiarities of the voice are retained in the transmitter, even on exceedingly long toll lines. The transmitter is just sensitive enough so that loud talking is not necessary.

Low battery consumption and extremely long life are other good points in this transmitter.

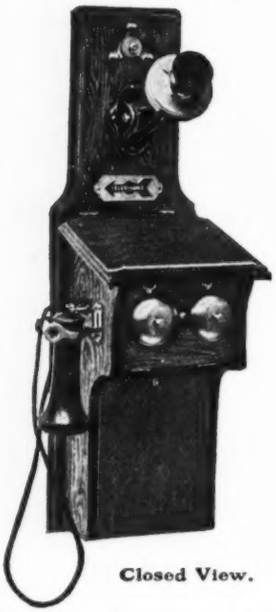
The mechanical construction is perfect.

NOTE:—We have our offices in the Frontier Telephone Company's Building, 332 Ellicott Street.

CENTURY TELEPHONE CONSTRUCTION CO.
536 ELLICOTT SQUARE
BUFFALO, N.Y.

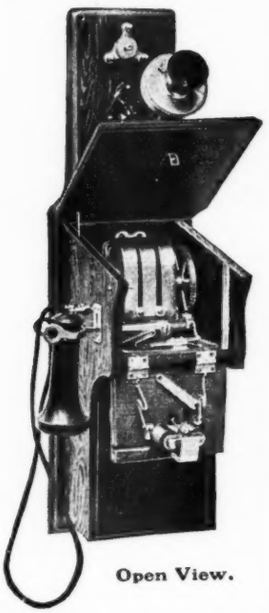
GET IN LINE ON UP-TO-DATE APPARATUS

If you buy Central "Leader Jr." Telephones you will be buying to-day what you are sure to buy ten years from now.



Closed View.

Central Fuse Block Lightning Arresters.



Open View.

Sample series or 4 or 5-bar Bridging "Leader Jr." Telephone shipped prepaid to any responsible party in the U. S. on 30 days' trial. Sample Fuse Block as above sent free to any one mentioning this ad.

CENTRAL TELEPHONE & ELECTRIC CO., 2135 Lucas Avenue, ST. LOUIS, U. S. A.

Telephone and Telegraph Wire

Made by continuous process from the best Rods obtainable. Possesses great Strength and high conductivity. Pliable, yet tough and uniform.

GUARANTEED STANDARD

Our Wire is known to the trade as, "Extra BB," "BB" and "Steel."

Your orders are earnestly solicited. Write for our quotations and Special Discounts.

Indiana Steel & Wire Co.
MUNCIE, INDIANA.

Bridging Telephones with Condenser Coils FOR FARMERS' LINES

Will ring through with every receiver, but the first and last, off the hook.

Send for Catalogue and Price List. Free on Application.

The D. A. Kusel Tel. & Elect. Mfg. Co.
1310 PINE STREET ST. LOUIS, MO.

Security Cable Trolleys

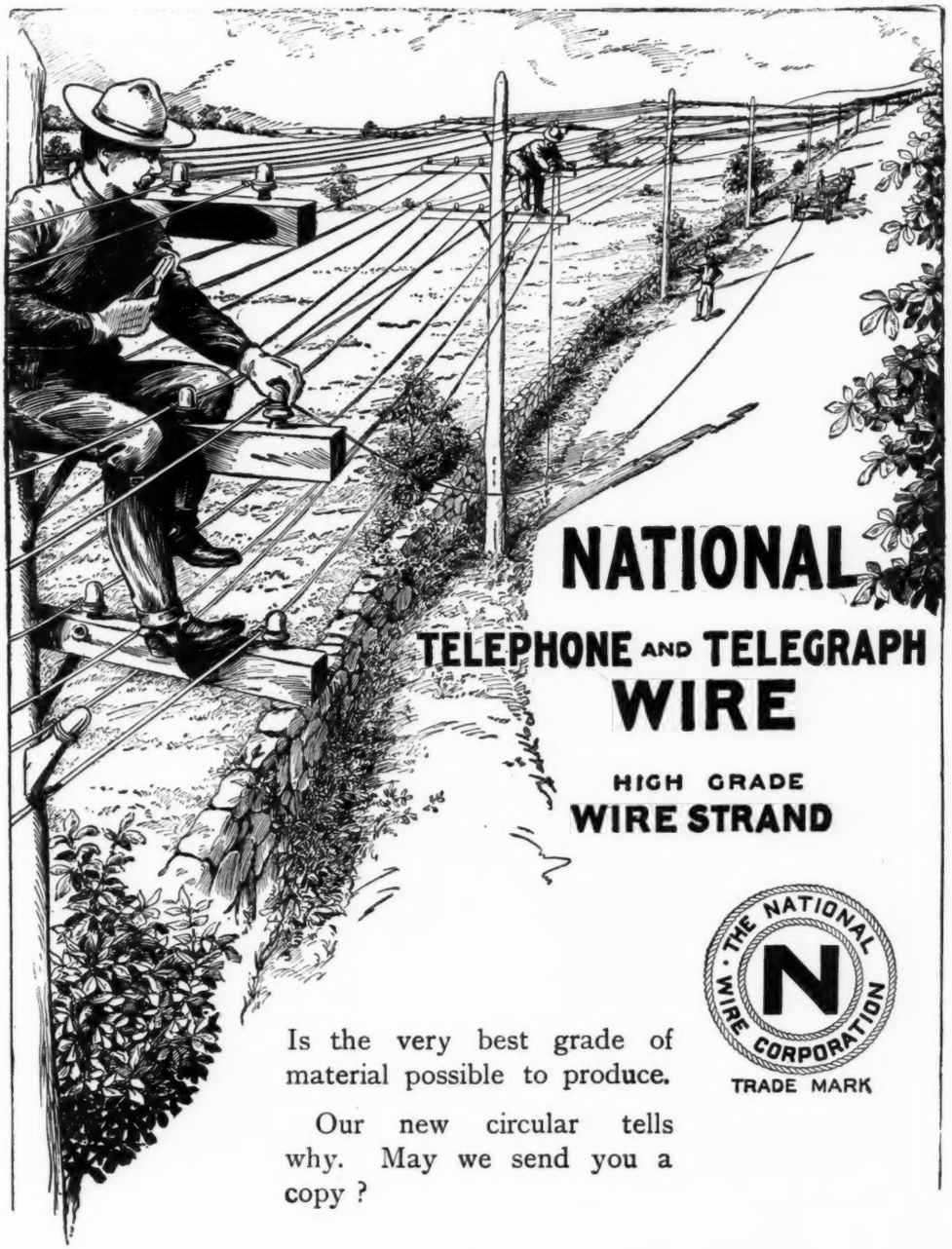
$1.50 each **$1.50 each**

Pull One Thousand Feet of Cable in less than one hour

One Gang Pulled Ten Thousand Feet in One Day. A set is usually Fifty Trolleys and they pay for themselves in the first using.

MADE BY
THE F. BISSELL COMPANY
TOLEDO, O.

Please tell the Advertiser you saw his Announcement in TELEPHONY.



Is the very best grade of material possible to produce.

Our new circular tells why. May we send you a copy ?

The National Wire Corporation

GENERAL OFFICES:

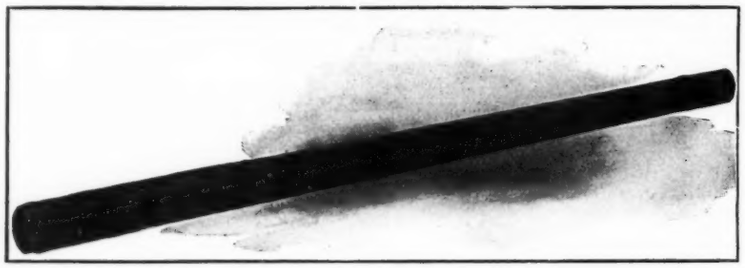
114-118 Liberty Street, New York City

Sales Offices and Warehouses

BOSTON NEW HAVEN CHICAGO KANSAS CITY ATLANTA SAN FRANCISCO

Bituminized Fibre Conduit

For Underground Construction



Combines the good features of other conduits.

Eliminates the bad features existing in many kinds.

Has valuable features not found in any other ducts.

We have a corps of experts in underground construction and are prepared to furnish supervision of work, if desired. We would prefer to co-operate with contractors in underground construction, but if desired will submit estimates and bids and take contracts for completed underground systems in any part of the United States or Canada.

AMERICAN CONDUIT COMPANY

Main Offices:
1005-6 Manhattan Bldg.
CHICAGO

Other Offices:
170 Broadway, New York
336 Macy St., Los Angeles

Cable Hanger Hooks

Actual Size

Made by Automatic Machinery

We can sell them at prices that are right.

Actual Size

Made from either bright steel or galvanized wire.

Also **re-galvanized** hooks, hot process method, no whitewash, guaranteed to stand the four immersion test.

Write to-day for prices.

National Telephone Supply Co.

1432 Superior Street, Cleveland, Ohio

CABLE TERMINALS FOR CABLE CONSTRUCTION.

25 Pair Type B.

Hall Cable Boxes

Neat, Substantial, Convenient, Designed for Underground and Aerial Installations, in all sizes; each pair provided with lightning protection.

Manufactured by

THE MOUNTAIN STATE ELECTRIC CO.

Correspondence Solicited. **WHEELING, W. VA.**

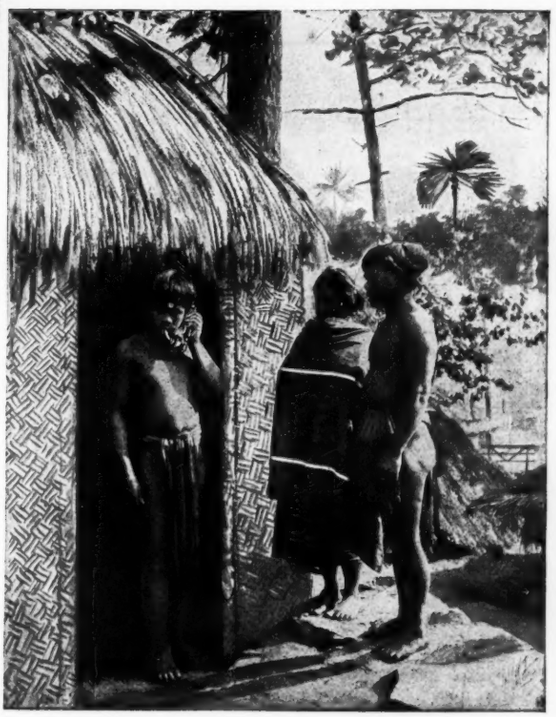
Please tell the Advertiser you saw his Announcement in TELEPHONY.

THE PENDENT

From North
to South

From East
to West

Its popularity
is unquestioned



Let Us
Tell You
Why

The VOUGHT-BERGER CO.

MAKERS OF FIRST-AWARD

TELEPHONES, SWITCHBOARDS AND APPLIANCES

LACROSSE, WISCONSIN, U. S. A.

THE PENDENT

Please tell the Advertiser you saw his Announcement in TELEPHONY.

PERFECTION IN PROTECTION

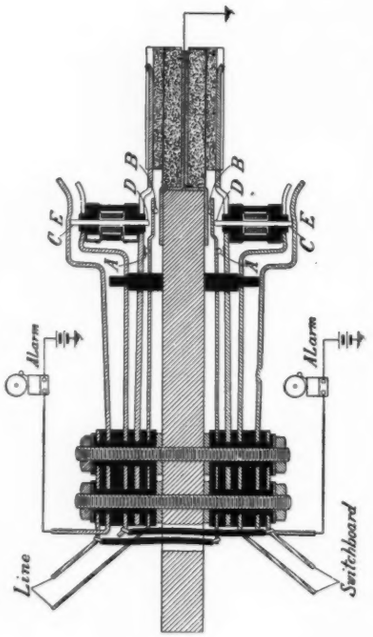
The KAISLING

No hair trigger coils.

Good, strong, heavy springs.

Cross connections permanently soldered.

Lava insulation on coils.



No hot air movements.

Heat cartridges easily removable.

No fibre insulation used.

Platinum Talking contacts.

The Best Test Plug. Easily Inserted.
Contacts Perfectly Made.

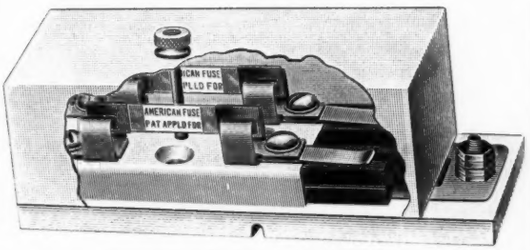
All American Protectors are made under the pioneer patent claims of Charles A. Rolfe and William Kaisling.

AMERICAN ELECTRIC FUSE CO.

CHICAGO NEW YORK ATLANTA

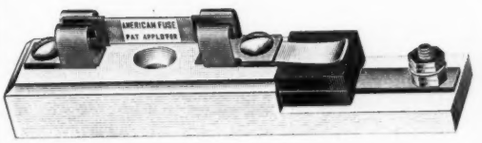
Please tell the Advertiser you saw his Announcement in TELEPHONY.

AMERICAN NEWS



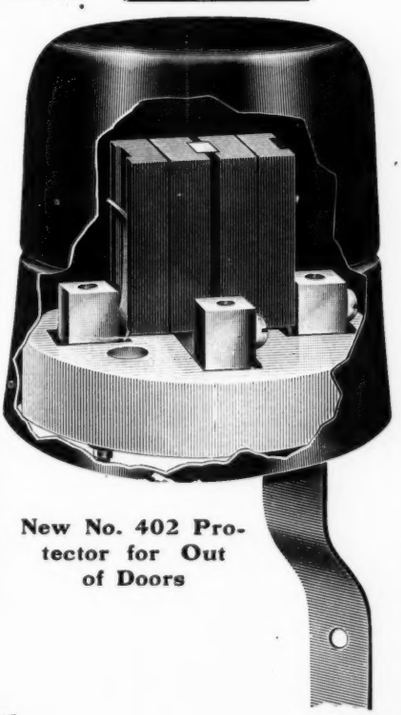
New Double Pole Lightning Arrester No. 85.

Look at the New Spring Clips



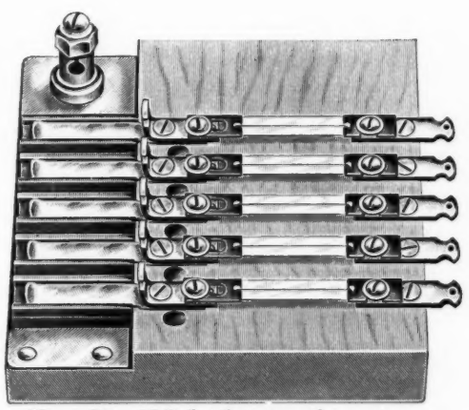
New Single Pole Lightning Arrester No. 41.

American Electric Fuse Co.



New No. 402 Protector for Out of Doors

Chicago
New York
Atlanta



New No. 135 Lightning Arrester and Fuse Strip

New No. 130 Lightning Arrester Strip

AMERICAN ELECTRIC FUSE CO.

CHICAGO **NEW YORK** **ATLANTA**

VILLAGE SWITCHBOARDS

And All Other Rural Switchboards Should Only Be Operated Our Way

BECAUSE

Drop only falls WHEN central wanted IS CALLED. No DISTURBANCE at Central when Subscribers call each other Night or Day, even if there are TWO Centrals.

Why cling to the "Curiosity Shop" ways you are now enduring? Do you not know that these "HAS BEENS" are about the most UNCERTAIN, LABOR and WEAR Wasting things that can be thought of?

REMOVE from your Switchboards the COW, SHEEP, SLEIGH, EXTENSION BELLS and the other "HAS BEENS.",

Use Drops made by the manufacturer of your Board in this VALUABLE space. Connect these Drops to OUR Selective Central RELAYS, and give your Subscribers PROMPT, CERTAIN service at a SMALL fraction of the labor, wear and attention that you are NOW THROWING AWAY at Central.

You can use the Telephones you have and have MUCH MORE power to call Central than to ring the Telephone Bells upon the party line.

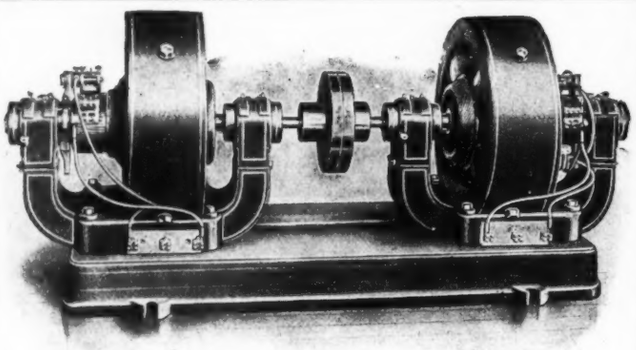
Call at our room at the National-Interstate Convention, June 21-23 at Chicago.

(GROUNDED, METALLIC OR "DIVIDED CIRCUIT")

T. & A. SELECTIVE CALL CO.

Sole Manufacturers — GENESEO, ILL., U. S. A. — Patents Allowed and Pending

Roth Bros. Twin Motor-Dynamos



Satisfactory results are being obtained by firms throughout the United States who use our Twin Motor-Dynamos for charging Storage Batteries, Telegraph Lines, Ringing Call Bells, Working Signals, Magnetizing Coils in Machinery, Electrotyping, Electro-plating, Electro-metallurgy and Ringing Telephone Call Bells.

Our Motor-Dynamos run on direct or alternating current circuits; we make them in special forms and for different purposes.

We guarantee our Twin Motor-Dynamos to be perfect both electrically and mechanically.

SEND FOR BULLETIN No. 147

ROTH BROS. & CO., Chicago

Crawfordsville Wire and Nail Co.

MANUFACTURERS OF

"MONARCH" BRAND HIGH GRADE

Telephone and Telegraph

WIRE

E. B. B.-B. B.-STEEL

Single and Double Galvanized Signal Strand

OUR WIRE STANDS THE MOST EXACTING TESTS.

IF YOUR SUPPLY HOUSE CANNOT FURNISH IT, WRITE US. WE CAN.

PROMPT SHIPMENTS ALWAYS.

CRAWFORDSVILLE WIRE & NAIL CO.

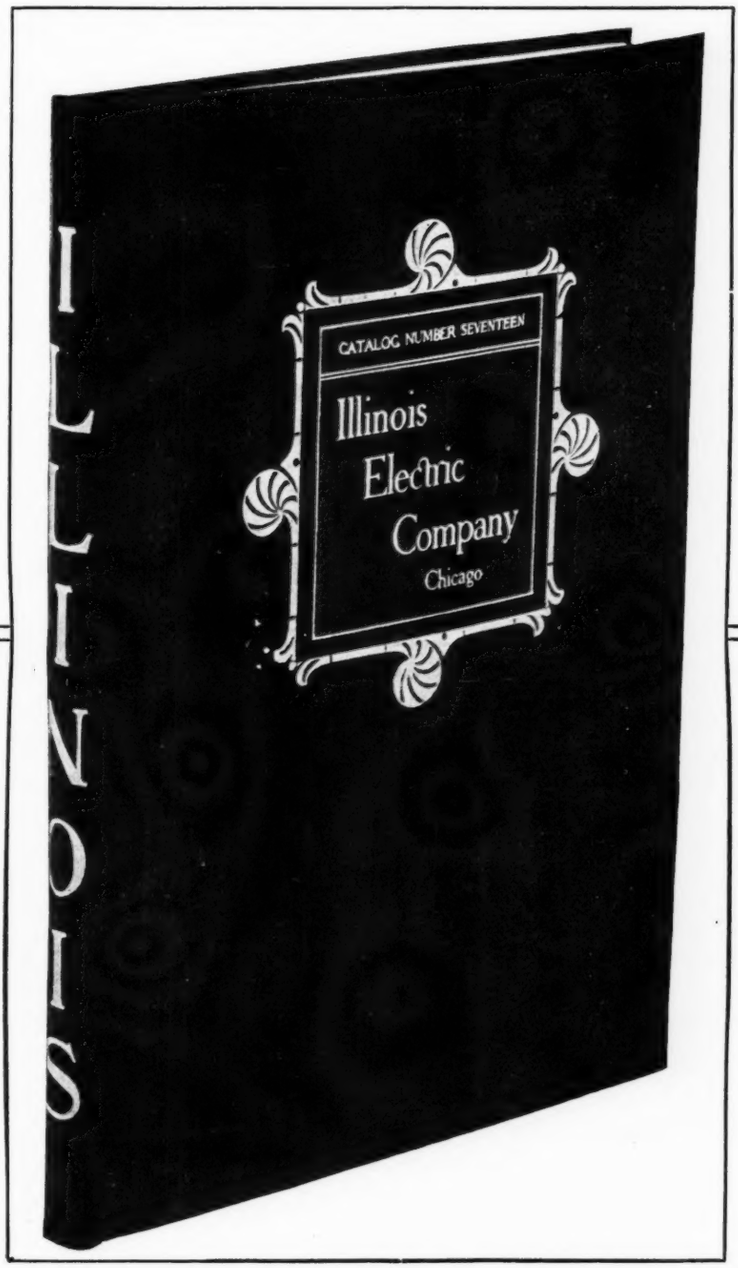
CRAWFORDSVILLE, INDIANA, AND 1501 MONADNOCK BLDG., CHICAGO.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

JUST OUT

Our Number Seventeen Catalog

Two hundred and twenty-four pages.



It illustrates and describes High Grade Telephone Construction Material, Cable Supplies, Telephone Protective Devices, Construction Tools, Testing and Measuring Instruments, Batteries, and Specialties, properly classified and indexed. **Sent prepaid express upon request.**

ILLINOIS ELECTRIC COMPANY

THE MODERN ELECTRICAL SUPPLY HOUSE. 239-241 Madison St., Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

BAIRD SELECTIVE RINGING AND LOCK-OUT SYSTEM

FOR PARTY LINE TELEPHONES

Central Office Calling Device

NORSTROM PATENTS

BEST SYSTEM FOR COUNTRY TOLL PAY STATION LINES

Not an experiment. We **guarantee it.** In **daily** service. **Highly commended by users.**

Complete Telephone or Lock-out Device only. May be **attached to Telephones in use. Twenty** (or less) **parties on a line.**

Others installed our system and **raised their rates. Why don't you?**

Write for Descriptive Circulars and Testimonials.

BAIRD MFG. CO., 3 Michigan St., Chicago, Ill.

Send for Catalogue of BAIRD PAY STATIONS

CORDS

We Manufacture

CORDS FOR TELEPHONES CORDS FOR SWITCHBOARDS.

Secure Our Prices

CABLES

We Manufacture

CABLES FOR SWITCHBOARDS CABLES FOR INTERIOR PURPOSES

Secure Our Prices

WIRES

We Manufacture

WIRES FOR SWITCHBOARDS

WRITE US CONCERNING OUR No. 100 SWITCHBOARD CORD

Secure Our Prices

RUNZEL-LENZ ELECTRIC MFG. CO. 97-101 South Clinton St., CHICAGO, ILL.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

BAIRD PAY STATIONS ARE USED EVERYWHERE

The almost universal use of Baird Pay Stations by both Bell and Independent telephone companies is conclusive proof not only that Baird machines are the best, but that pay stations are a profitable investment. A **few** of the features which have made Baird apparatus so popular are:

Loud Signals. A lever with one-man power behind it insures loud, clear signals.
Rejector Pocket throws out coins deposited in the wrong slot, preventing controversy.
Flipper, a remarkable improvement which prevents the deposit of more than one coin at a time.
Air Valve, which retards the return of the operating lever and makes the operation of the machine noiseless excepting the sound of the signals.

Catalogue fully describing the many distinctive features of our pay stations and measured service equipment will be sent on request.

If you are interested in a selective ringing lock-out system read our advertisement on opposite page.

Baird Manufacturing Company

3 Michigan Street. :: :: :: :: :: CHICAGO

Where Quality is High

IT IS

Economy to Buy

BEST GRADE OF

Cross Arms, Pins, Brackets and Telephone Wire

CHICAGO TELEPHONES SATISFY

Hemingray Insulators, Security Specialties, Illinois Pole Changers

Carried in

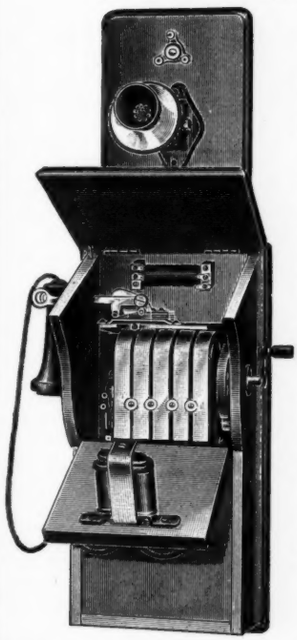
OMAHA STOCK

Western Electrical Company

1212 Farnam St. Omaha, Neb.

ARE YOU AWARE

you are not giving yourself a fair show to secure the best results until you try our new



Inter State Trunk Line Central Energy and Magneto Telephones

YOU CAN TALK BETTER by using our new Inter State "Solid Back" Transmitter. Its perfect tone and great intensity can only be appreciated by a trial.

YOU CAN HEAR BETTER with our Long Distance "Loud Speaking" Receiver with no exposed metal parts and permanent adjustment.

YOU CAN RING BETTER with our "Sampson" generator having imported steel magnets and Laminated Armature.

Our Five Year Guarantee With Every Telephone.

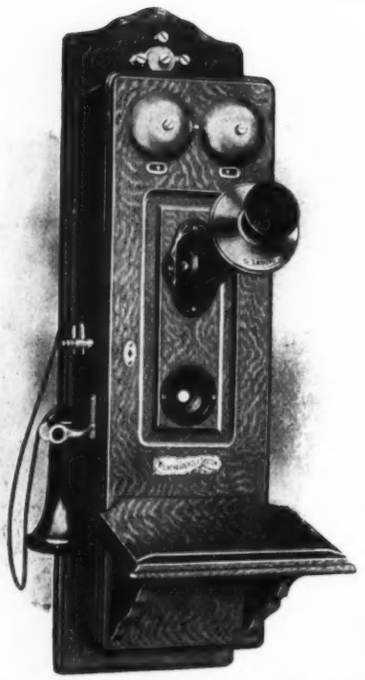
The Gemmill Telephone & Mfg. Co.

ORRVILLE, OHIO, U. S. A.

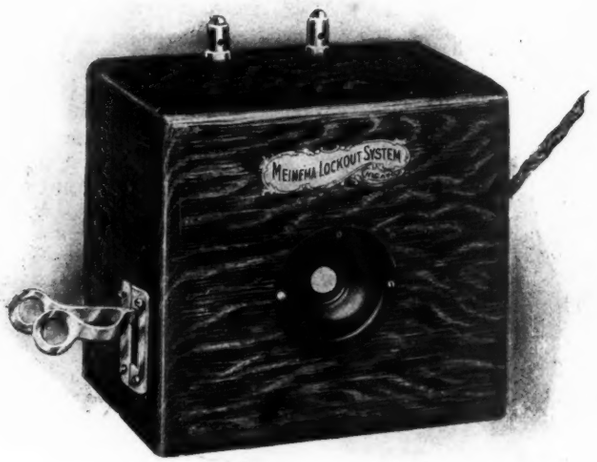
Please tell the Advertiser you saw his Announcement in TELEPHONY.

DIVIDEND EARNERS

Twenty 'Phones on a Line



Complete 'Phone with Self-Contained Selective Ringing Lock-Out Device.



Selective Ringing Lock-Out Attachment for Use with 'Phones Already Installed.

PRIVATE SERVICE

Meinema Lock-Out System

Let us tell you how you can make

Party Lines Popular and Profitable

Special inducements for June.
Be sure and see our exhibit at Interstate Convention.

M. B. AUSTIN & COMPANY

56 & 58 WEST VAN BUREN ST.
CHICAGO

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Burns Adjustable Desk Telephone

How is this for the most perfect and convenient desk telephone equipment. Prices low. Write us to-day.

LEICH—Only satisfactory 4-party selective system.

American Electric Telephone Company

VISIT US AT OUR NEW ADDRESS

64th and State Sts., Englewood Station, Chicago, Ill.

Here we have erected and moved into the most modern and best equipped telephone factory in existence. *Nearly 200,000 square feet of floor space.*

We make everything in the telephone line. *See rear cover for list of catalogues and bulletins*

How is this for selective farm lines?

Write us about our special farm telephones, push buttons and ring thru' condensers.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

STROMBERG-CARLSON CABLE

If you want the best

LEAD COVERED CABLE

manufactured by the

LATEST APPROVED PROCESS

give us the order

Pure Lead, or 3 Per Cent or Less of Tin, As You Want It

Conductivity 98 Per Cent of That of Pure Copper. Double Wrapped Paper Insulation

Cables made to meet your own specifications

We guarantee our cables to be as represented

Our list of users the best guarantee

STROMBERG-CARLSON TELEPHONE MFG. CO.

ROCHESTER, N.Y. CHICAGO, ILL.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

STROMBERG-CARLSON

Standard Central Energy Wall Telephone

This illustrates a type commonly known as our No. 611.

It's Unlike Any Other Telephone

Because—the cabinet when opened exposes **all** the apparatus.

Because — there are no bridging posts, screws or fastenings exposed when the cabinet is closed.

Because — the cabinet is made of the highest grade of quarter sawed oak and highly polished.

Because — of the superior method of fastening the hinged part of the cabinet when closed. There are no screws to get lost.

Because—the hookswitch is so positive in operation and substantial in construction.

Because—the hook lever can be removed so readily.

Because—the receiver cord has better terminal fastenings.

Because—the transmitter arm is fastened with bolts.

Because—more care and attention is given to the small details. The best proof of this is our list of users.

Because—the transmitter and receiver has **no equal.**

We will soon issue a new Central Energy telephone bulletin. It will contain a complete description of this telephone and many others, all of which reduce the cost of maintenance. May we mail you one of the first copies?

TELEPHONE M'F'G. CO.

ROCHESTER, N.Y. CHICAGO, ILL.

We handle a complete line of Telephone and Electrical Supplies

AMERICAN ELECTRICAL SUPPLY COMPANY

All orders are given careful attention and shipped promptly

GENERAL SALESROOM, AMERICAN ELECTRICAL SUPPLY COMPANY, CHICAGO

WE solicit your inquiries and request a sample order. We promise you courteous treatment, careful attention, prompt shipment and low prices. At least, let us quote you on your next order.

American Electrical Supply Co.

83-85-87 Fifth Avenue, Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Protect Your Switchboard

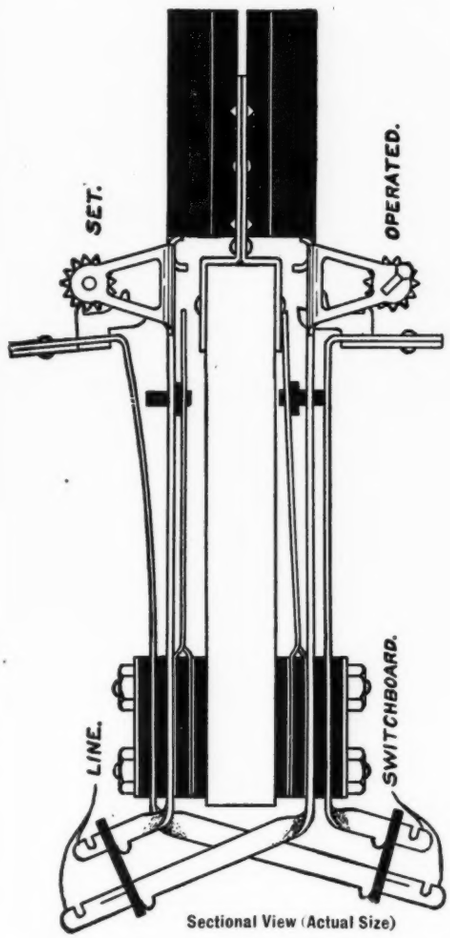
WITH

COOK'S NO. 8

Self Soldering Protector

Simplest and Most Efficient

Easiest to Set After Operating—Coils Do Not Have to Be Reversed



Sectional View (Actual Size)

Only Two Contacts in the Circuit.
No Exposed Solder to Corrode.
No Bolt or Soldered Connections Used in Transposing Line and Switchboard Terminals. :: ::
An Automatic Alarm that Always Works. :: :: :: :: ::
The Only Protector on the Market Covered by Broad Patents, and Using the Only Test Plug Ever Patented. :: :: ::

Frank B. Cook, Mfr.

242 West Lake Street CHICAGO, ILL.

The Automatic Electric Company

Will be "at home"

Suite 622, The Auditorium Hotel

, and at their

Factory, Van Buren and Morgan Sts.,

During the

National-Interstate Independent Telephone Association Convention

At Chicago

June 20th, 21st and 22nd

and will be pleased to receive at either place the delegates and visitors to the convention for the purpose of demonstrating the Automatic Telephone System.

The Eureka Electric Co.

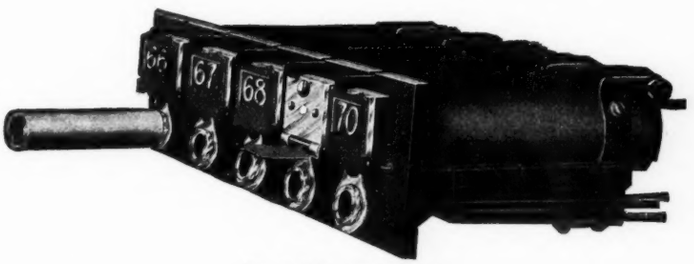
MAKERS OF

Highest Grade Telephone and Switchboard Apparatus Only

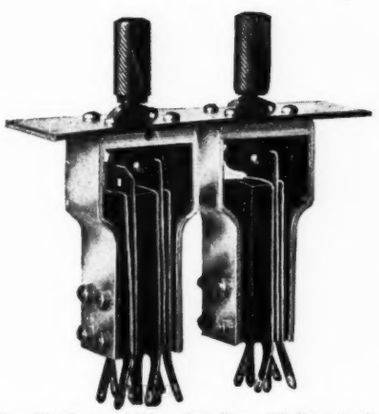
The New Eureka Apparatus is *positively* the *best* in the field

WHY?

Because it is built by *skilled mechanics* from honest materials and under the supervision of Electrical Engineers who stand pre-eminently at the head of their profession.



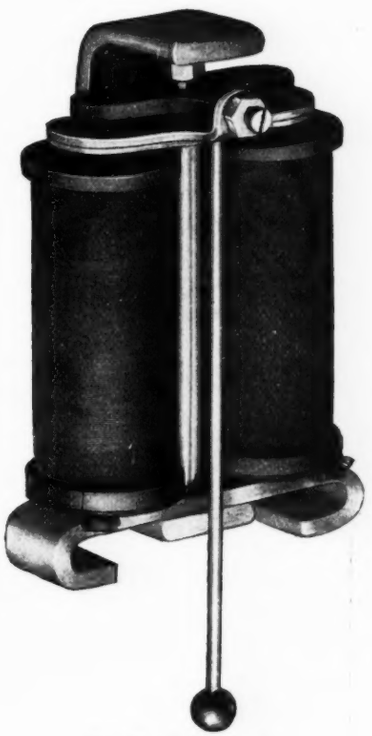
New Self-Restoring Drops



New Ringing and Listening Key with Ring-back

FOUR OF A KIND IMPOSSIBLE TO BEAT

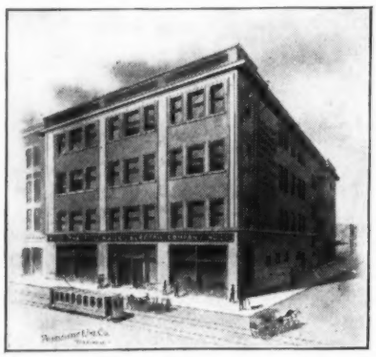
New Long Distance Transmitter



New Ringer Movement

No order too large for our capacity. No order too small for our careful attention. Catalogue for the asking.

Main Office and Factory, = Genoa, Illinois



May 1st we will move to our
NEW BUILDING
28-30-32 St. Clair Street

Increased facilities for handling orders promptly.

We manufacture

"Ready" Pay Out Reels
"Ready" Telephones
"Ready" Line Material
"Ready" Pole Seats

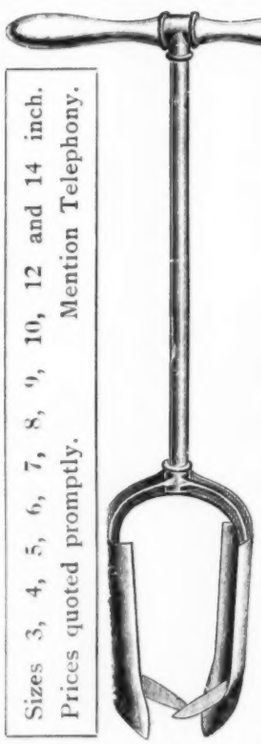
Agents for

Gray Pay Stations

Try our "Red Tracer" Telephone Duplex.

The W. G. Nagel Electric Co.
Toledo, Ohio

A TELEPHONE AUGER



that will save you money on your line construction. Pays for itself the first mile. The **10, 12** and **14** sizes of the Iwan Pat. Post Hole and Well Auger are especially adapted for telephone and telegraph construction.

Fills quickly
Empties easily
No suction when removed from hole

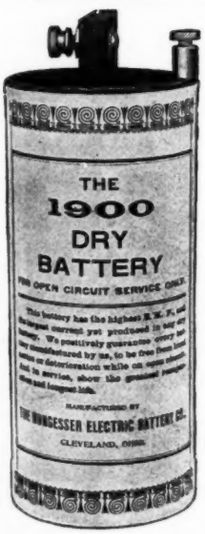
The best earth auger for all conditions of soil. Sold by wholesale and retail hardware merchants and Telephone Construction Supply Companies.

Sizes 3, 4, 5, 6, 7, 8, 9, 10, 12 and 14 inch. Prices quoted promptly. Mention Telephony.

Manufactured only by

IWAN BROTHERS, Streator, Ill.

Battery Talk is Cheap



but when backed up by the real article

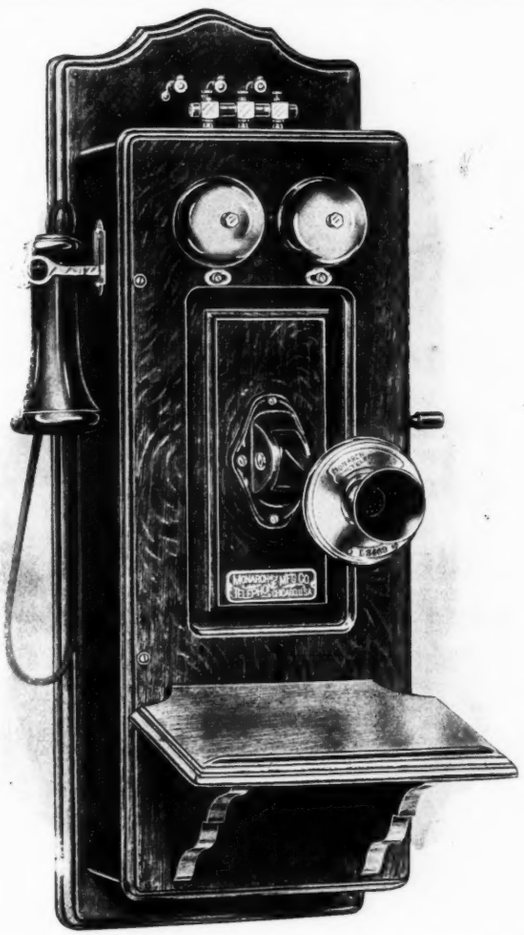
The
1900
is used

Manufactured by

The Nungesser Electric Battery Co.
CLEVELAND, OHIO
General Sales Office: 128 West Jackson Blvd., Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

MONARCH APPARATUS



SPECIAL BRIDGING TELEPHONES.

We make Bridging Telephones for various kinds of service. A few of the special features are as follows:

Condenser in secondary circuit so that central or any subscriber can ring by any number of telephones which have their receivers removed.

Pulsating and Alternating current generators with push buttons to call central without disturbing the other subscribers. For either metallic or grounded lines.

Push Button to ground generator so that subscribers may ring each other without disturbing central, and may signal central without disturbing the other subscribers. For metallic lines only.

We have several other ideas for the betterment of party-line service, all of which will be described upon request. Prices sent upon application.

MONARCH TELEPHONE MFG. CO.

12-16 South Clinton Street Chicago, Illinois

WASHINGTON FIR
=CROSS ARMS=

Chicago, Minneapolis or St. Louis delivery

CARRIED IN STOCK

Standard Sizes Electric Light and Telephone. Also Telephone Arms with center hole for ½ inch bolt

PRICES ON APPLICATION

CORDS

FOR YOUR SWITCHBOARD
FOR YOUR RECEIVERS

WE FURNISH THE BEST CORDS THAT ARE MANUFACTURED

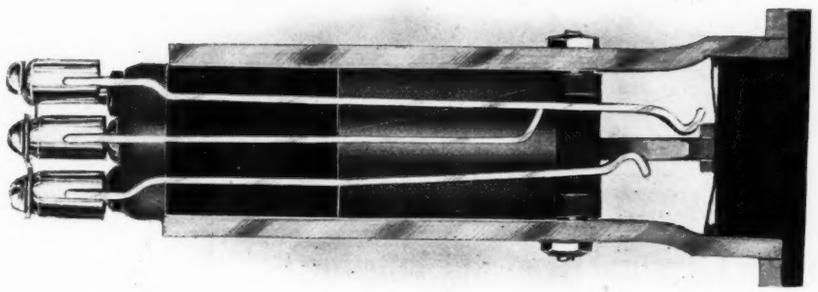
WRITE FOR FULL INFORMATION

ELECTRIC APPLIANCE COMPANY

ELECTRICAL SUPPLIES **TELEPHONE MANUFACTURERS**

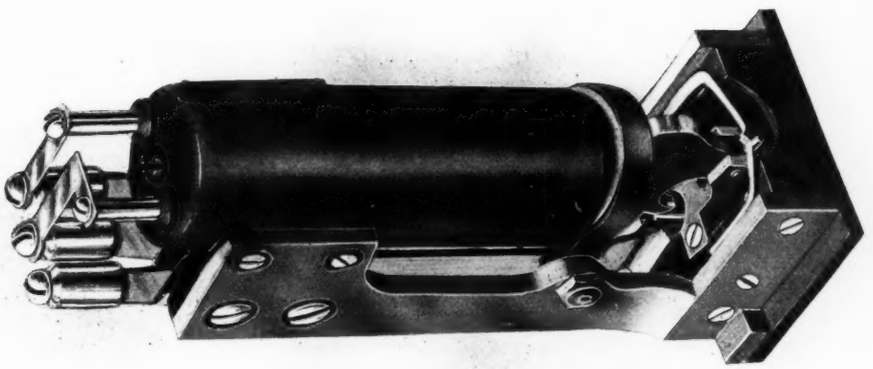
CHICAGO AND SAN FRANCISCO

Two More Views
of the
New Western Self-Restoring Drop



View of bottom of drop showing operating springs

View of top of drop showing shutter and operating parts; also connections



WRITE FOR SAMPLE AND FORM YOUR OWN OPINION

We Also Make

The Best Bridging and Series Telephones

Do You Know About

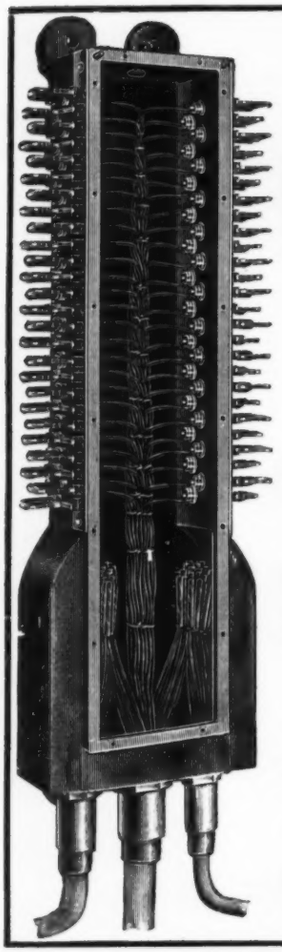
Western Four-Party Selective Telephones

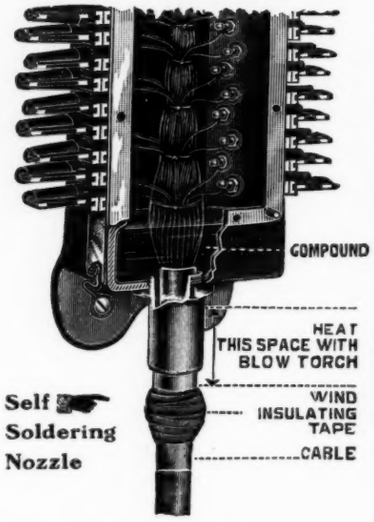
Central Energy or Magneto

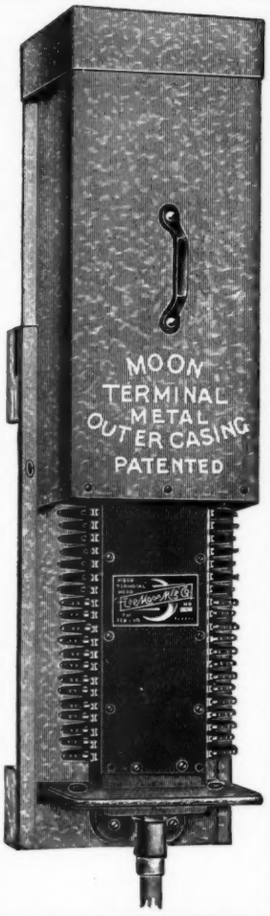
WESTERN TELEPHONE MANUFACTURING CO.

CHICAGO

The Pioneer Independent Telephone Factory







Moon Junction and Splicing Box

Moon Terminal Head and Metal Outer Case

Moon Combination Terminal Head and Junction Box

All with Self Soldering Nozzles and require no special skill to install. This is simple, practical and reliable apparatus, which is being extensively used with the most economical plan of cable distribution. Write to us about it. Let us figure on your specifications.

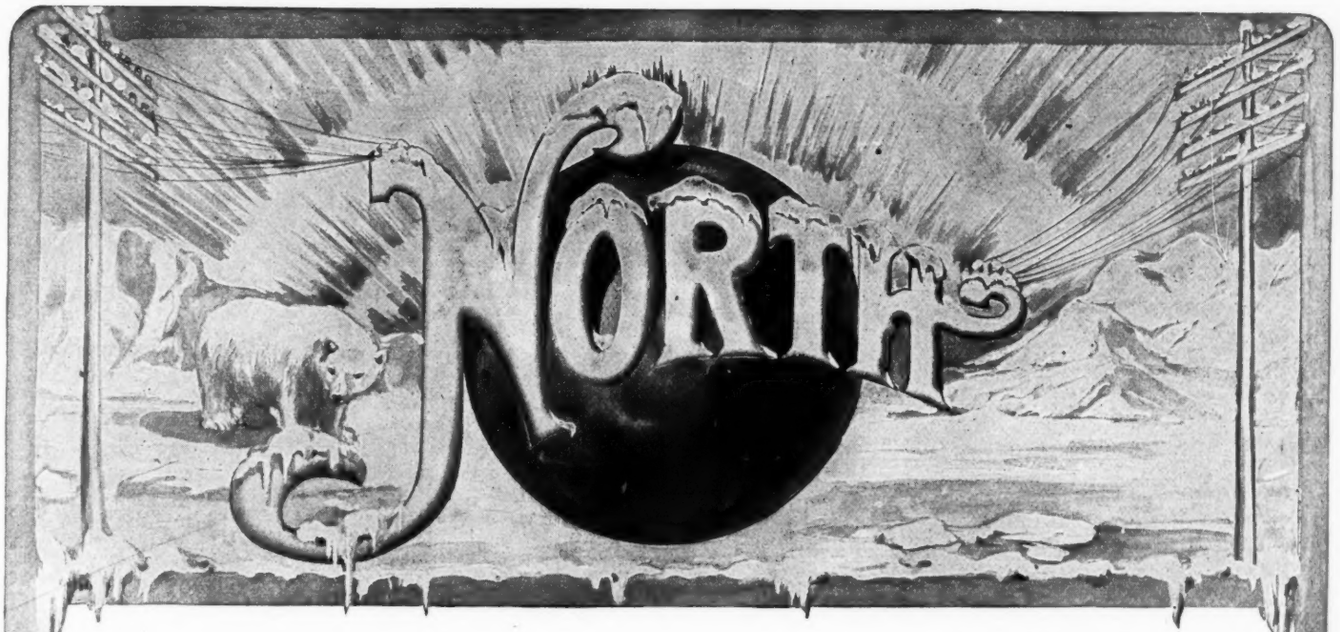
MOON MFG. CO., 43-45 S. CANAL ST., CHICAGO, ILLINOIS

POINTERS

We Can Save You Money.
Give You Better Quality Material.

WRITE OUR TELEPHONE DEPT. FOR ADVICE

Commercial Electrical Supply Co.
1007-1009 Market Street, St. Louis, Mo.



REGARDING PARTS

A Telephone supply part isn't of much value 'till you NEED one. Then you want it in a HURRY. Did you ever consider the average exchange manager's hardship in obtaining, WITHOUT DELAY, a part that fits EXACTLY?

You have a sudden influx of subscribers demanding additional drops and jacks, or a part breaks. You wire the factory. If you have "NORTH" equipment you get that part by FIRST express. When received it fits without blacksmithing or machine work. Because "NORTH" parts are milled and bored in jigs—accurately, to a thousandth part of an inch. To own these jigs requires an outlay so large that it is warranted only where switchboards, telephones and parts are made in large lots.

If you don't have "NORTH" equipment you must depend on makeshifts that give poor service; suffer long waits in providing for new subscribers, thereby losing the revenue, until the part can be MADE. Why? Because most manufacturers don't keep supply parts on hand. They make a few telephones, switchboards and parts at a time, and change pattern frequently. To keep a stock of parts, representing every change, would tie up a fortune in practical idleness.

Then when you get that MADE part, blacksmithing or machining is necessary. For, where parts are made by hand, without jigs, it is impossible to produce exact duplicates.

Another thing, when an equipment becomes second-hand, its value is very low, unless the buyer is assured of getting duplicate parts at any time. This is one reason why "NORTH'S" command higher second-hand prices.

For saving of time and money, everything "NORTH" is valuable.

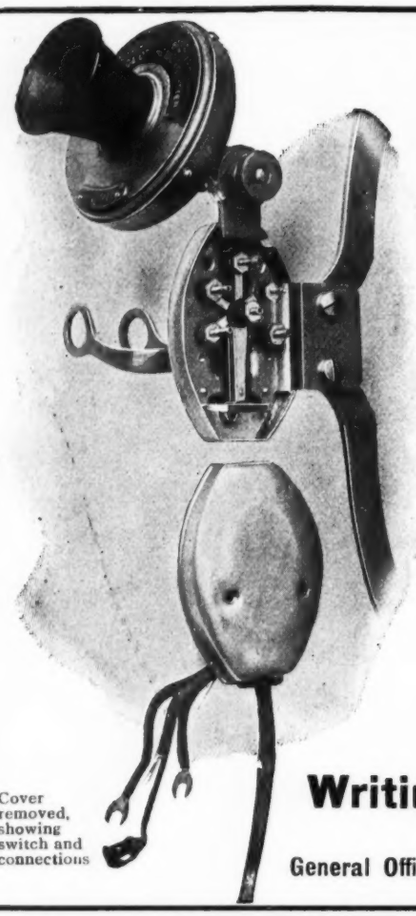
MAIN OFFICES & FACTORY,
ST. CLAIR ST.,
CLEVELAND, OHIO.

SOUTHERN OFFICE & WAREHOUSE,
MAIN ST. & BROADWAY,
DALLAS, TEXAS.

WESTERN OFFICE,
MONADNOCK BLDG.,
CHICAGO, ILL.

THE
NORTH ELECTRIC CO.
CLEVELAND, OHIO

MANZ CLEVD.



Cover removed, showing switch and connections

THE

ADJUSTAPHONE

The Ideal Telephone

Adopted by both Independent and Bell Telephone Companies throughout the country.

First cost less than desk set.

Maintenance cost reduced to a minimum.

Made for roll top, flat top desk or wall.

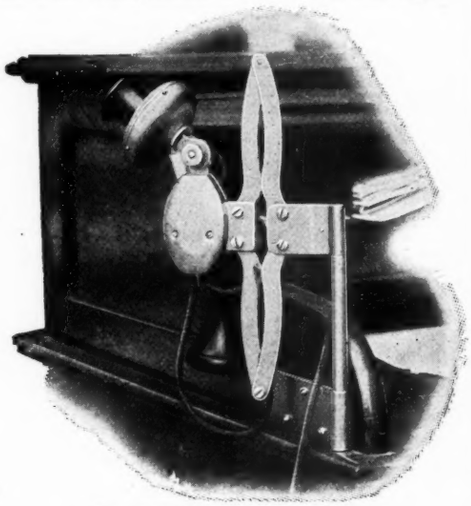
Write to-day for prices and full particulars.

Address Telephone Department

Chicago Writing Machine Co.

MANUFACTURERS

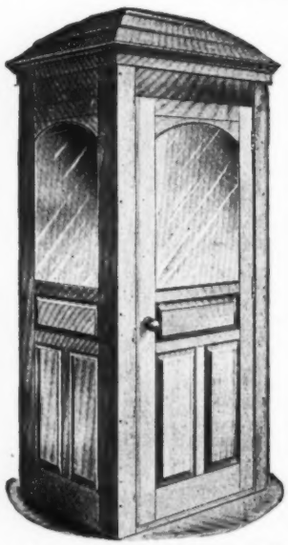
General Offices: 151-153 Wabash Ave., CHICAGO



No. 1 Closed and swung out of the way.

Quiet and Privacy

If SEAMAN BOOTHS Are Used For Public Telephones



The above cut represents a double walled low-priced booth.

WOULD not the value of your service, from public telephones, be enhanced and the number of calls increased if patrons could always be assured of **Quiet** and **Privacy?** The absolute necessity for such conditions has developed the sound-proof booth. Its use means better service, increased business, satisfied patrons and better dividends. Don't forget that. It means better dividends. Let us tell you what we know about this booth question. We have had many years' experience and will gladly share our knowledge with you.

Write us to-day.

W. S. Seaman & Co.

114 So. Water St., MILWAUKEE, U. S. A.

WIRE

Interior Telephone "Monarch" W. P. Iron, Bare Iron and Steel Galvanized Messenger

WIRE

All are carried in stock by

Monarch Electric & Wire Co.

125-127 S. Clinton St., CHICAGO.

DEAN TELEPHONE APPARATUS

Did you ever stop to consider what a good 4-party selective ringing equipment together with a good common battery multiple switchboard would do for you?

The largest item—the cost of outside construction would be halved.

The size of the switchboard would also be correspondingly reduced, resulting in a big saving in the first cost of the plant.

The number of operators necessary for the best possible service would be less than for an individual line switchboard—a saving in the continual expense of the plant.

The cost of running the drops and installing each 'phone, whether for party line or individual line service would be the same, there being no grounds or third wire connections required at our party line telephones. This is a very important item.

The simplicity of our apparatus and circuits would give you an extremely small maintenance expense—also a continual expense item.

The transmission would be the best that can be had, so you would not suffer on this score.

We would like to have a chance to prove these assertions.

Following are some of our common battery multiple switchboard orders which are an evidence of the success of our product. Each of these systems is complete and is equipped for our 4-party line ringing with individual indicating ringing keys in each cord circuit:

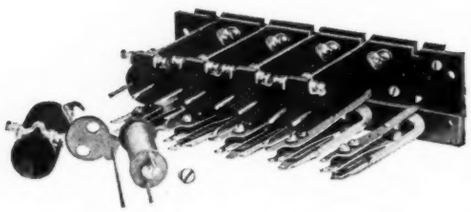
Plattsburgh, N. Y.	Watervliet, N. Y.	Poughkeepsie, N. Y.
Dunkirk, N. Y.	Niagara Falls, N. Y.	Pittsburg, Pa.
	Racine, Wis.	

THE DEAN ELECTRIC COMPANY
ELYRIA · OHIO

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Standard's New Drop Attachment

Renders it possible to remove the complete drop entirely from the rear of the board. By inserting a screw driver and just loosening two screws allows the drop to be raised slightly and



taken directly out. Notice the clips that slip over the screws on the frame. Also that there are ONLY four parts to the drop when unassembled. The jack is just as accessible. Write to the factory for further information.

STANDARD TELEPHONE & ELECTRIC COMPANY

348 Jefferson Street, MILWAUKEE, WIS.

DON FARNSWORTH **FRANK L. BILLS**

FARNSWORTH, BILLS & CO.

High Grade Telephone Stocks & Bonds

Suite 350 Railway Exchange

TELEPHONE **Strowger Automatic 9719**
Bell, Harrison 2810

JACKSON AND MICHIGAN BLVDS.

CHICAGO, ILL.

Automatic Soldering Iron and Blow Torch

Furnished with two coppers, one for regular work and one for heavy work. Nothing complicated. No pump to get out of order. No platinum coil to burn out. Never too hot and never too cold. No wind will blow it out. Can be changed to blow torch instantly. Can be carried in any tool kit, or lineman's belt. Will last for years. Used by Electricians, Linemen, Tinners, Plumbers and Painters. Guaranteed to give satisfaction. If your jobber does not handle them, write us for illustrated booklet and price.

EMMELMANN BROS. MFG. CO., - - Indianapolis, Ind., U. S. A.

THE H. B. CAMP CO.

MANUFACTURERS OF

"Camp" Standard Vitrified Clay Conduits.

SALES OFFICES:

85 Hartford Building, CHICAGO. **170 Broadway, NEW YORK.**

Be Sure You're Right, Then Go Ahead

We hereby warn all manufacturers that we are the exclusive owners of the Lundquist automatic trunking patents which cover all forms of automatic trunking in telephone systems. Together with the Lundquist trunking patents, we own forty patents in the United States, and the principal foreign countries covering automatic telephone apparatus, devices and circuits. We advise those contemplating the installation of automatic telephone systems, to buy only from those manufacturers who have the right to manufacture under our patents. Then not only will they avoid becoming liable for damages by reason of infringements, but they will be supplied with the most complete and perfect equipment by reason of the modern methods used by reliable Independent telephone manufacturers supplying apparatus under our patents.

Remember, too, that the Globe patents are so broad that no automatic telephone system of any kind can be made without infringing them. We are simply saying this now for the benefit of everyone concerned. We want you to write us at once and we will tell you all about the Automatic situation.

Be sure you are right, then go ahead.

Globe Automatic Telephone Company

CHICAGO OFFICE, SUITE 712 59 Dearborn Street

Please tell the Advertiser you saw his Announcement in TELEPHONY.

OKONITE TEL. and TEL. WIRES

INCREASE THE VALUE OF YOUR SYSTEM

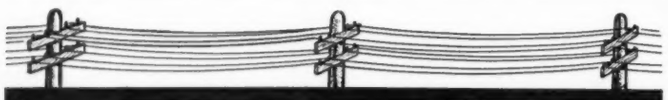
Telephone Construction Material

of All Kinds

WRITE FOR CATALOGUE No. 23

Central Electric Company

207-209-211 East Jackson Boulevard CHICAGO

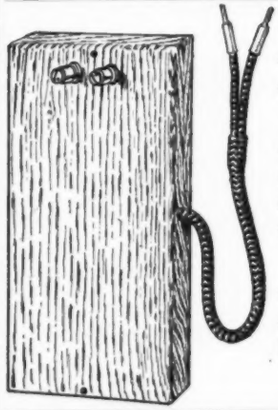


LOW COST MANY ADVANTAGES

To Improve Your Signaling Conditions Equip Your Telephone With

ANDRAE

Telephone Condensers



By so doing you get surer, quicker and better all round service on your entire line.

Andrae Condensers are the most practical in use. Unlike most others they **improve** the signaling without decreasing the efficiency of the talking.

Use them and do away with evils caused by "listening in" and leaving receivers off hooks.

Write for More Information.

JULIUS ANDRAE SONS & CO.

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EASY TO INSTALL :: :: SEND FOR BOOK No. 11

VEEDER SWITCHBOARD COUNTERS

(STYLE 8)

Show rate of increase, so that exact calculations for the future may be made.

They likewise show how better to divide the work on the board among the operators.

Number of calls during each hour of the day can be shown. Interesting statistics are easily obtained by their use. Sockets fit in keyboard permanently. Counter can be inserted or removed at will.

Free Booklet describing 10 styles of Counters.

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Cyclometers, Odometers, Tachometers, Counters, and Fine Castings.

the NICHOLAS TELEPHONE SELECTOR

IMPORTANT. During the month of June we will sell the Nicholas Telephone Selector for $8.00. This price will be withdrawn June 30.

REMEMBER. The Nicholas Telephone Selector is warranted to give perfect satisfaction and is sold under a positive guarantee.

Meets all the Requirements

ONLY TWO POINTS OF CONTACT IN THE ENTIRE APPARATUS

IN calling your attention to the **Nicholas Telephone Selector** for use on party lines, we want to emphasize the fact that it is in a class by itself, and must not be confounded with anything of this nature that has heretofore been on the market, or is claiming any attention at present. A few of the good things and advantages we claim for it are as follows:

1. Absolutely full metallic, no grounds or "common returns" required.
2. The only selector that will work on a bridged ground line.
3. Will work in connection with your present equipment.
4. Your lines are at all times under absolute control of the operator.
5. Two or more subscribers can be brought in on the same line, and all others locked out.
6. A **perfect** selective ringing and lock-out device. We might enumerate other unique features, but it must be seen and had in use to fully appreciate all of the good points.

These selectors have been in constant, practical use since September, 1904, giving perfect satisfaction, not a single case of trouble or complaint since their installation, which was accomplished from our simple directions accompanying each selector with no material change at "central."

The device is easily and quickly installed, as will be noticed from the following instructions for setting it up:

Fasten the selector on the wall near the telephone; take the "duplex" or incoming wire from the 'phone and connect it to the binding posts, Nos. 4 and 5 in the selector. From posts No. 1 and No. 2 run wires back to the 'phone. Disconnect the wire that connects the ringer to the line post of the 'phone, lengthen it out, and connect it to binding post No. 3 in the selector. Then call "central" and have them call the station you are at. If the selector does not move in the right direction for selecting, reverse wires Nos. 4 and 5. After the selection is made if the bell does not ring reverse wires No. 1 and No. 2.

The office equipment is a simple ringing key, placed in the generator circuit. When the key-knob is straight up the board is in condition to receive the ringing current. But when thrown forward or back, will bring in the selecting and restoring current.

Any pair of cords can be used at operator's position for selective purposes.

We do not manufacture or attempt to sell telephones, but the telephone selector only.

For any further information, price, terms, etc., address

The Nicholas Telephone Selector Co.

Rochester, N. Y.

PUZZLE

C.C.C. TELEPHONE APPARATUS TRADE MARK

WHO'S MARK IS THIS?

PRIZES FOR CORRECT ANSWERS TO THESE QUESTIONS

Who's mark is this?
What do they make?
What Brands?
Where are they located?
Where did you get your information?

First Prize.—A pair of Donnelly eastern climbers with straps complete, handsomely nickel plated.
Second Prize.—A pair of Fry's patent pliers, 8-inch, handsomely nickel plated.
Third Prize.—A pair of Bernard's cutting pliers, 5½-inch.
Fourth Prize.—Pair of 10-inch splicing clamps, handsomely nickel plated.
Fifth Prize.—Electrician's scissors, handsomely nickel plated.

Everybody has an equal chance. See page 533 of this issue of Telephony for conditions governing this contest.

OUR WINNER

Strongest Ringer and Best Talker. For Long Lines. Twenty to Thirty on a Line.

Sent out on 30 days' trial, can return at our expense if not satisfactory. We make 3 bar, 4 bar, 5 bar and 6 bar strong ringers. Ask for prices. We guarantee all our goods. Established ten years.

TELEPHONE SUPPLIES, LINEMEN TOOLS.

Ask for prices on Wire, Brackets, Pins, Cross-Arms and Braces, Glass Insulators, Knobs, &c. High Grade Switchboards for Exchanges and Farmer Lines. Prompt shipments.

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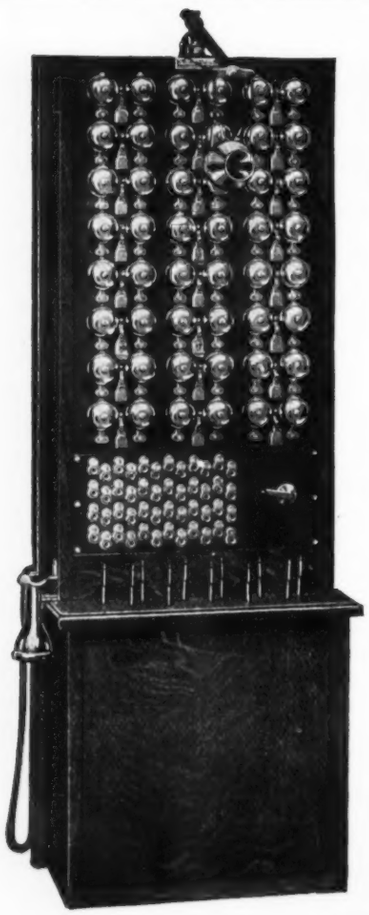

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Especially for Rural Installations

May be higher in price than others, but the difference becomes profit by saving in operation.

Correspondence invited with interested parties.

Sample to be on exhibition at Chicago Convention in June.

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Largest Anchor Made.

CHEAPEST IN PRICE.

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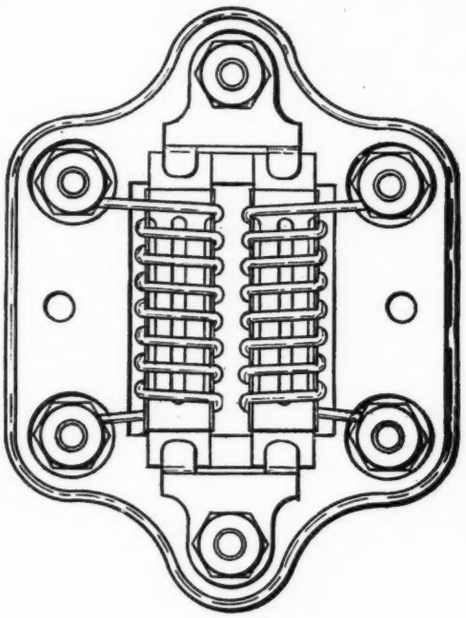

There has never been known a case where lightning has passed

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Why not protect your valuable dividend earning telephones by sending **75c** for sample—discounts for quantities.

Ask for Pamphlet 38X

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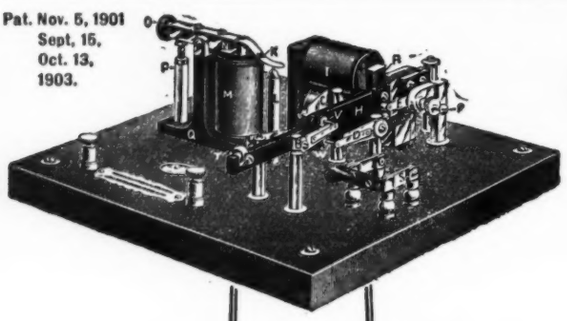

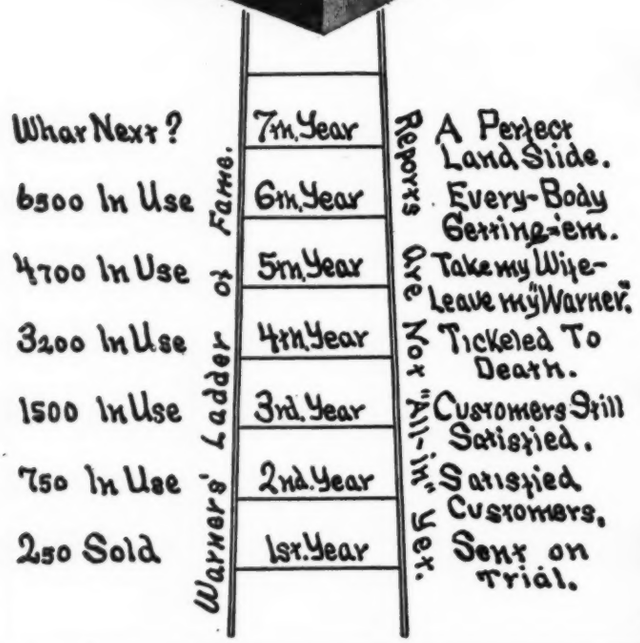

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The ascent has been made on **MERIT** and giving our customers the best of

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Dry Batteries

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"It has stood the test"

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Wire to ground, with push button for ringing metallic

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Standard Portable Direct Reading

Voltmeters, Millivoltmeters, Voltammeters, Ammeters, Milammeters, Ground Detectors and Circuit Testers, Ohmmeters, Portable Galvanometers.

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Range .001 ohm to 11 megohms. Reversing plugs done away with. Only four plugs to be manipulated in rheostat. New form combination keys. Fitted for Murray and Varley tests. External batteries and galvanometer can be used when desired. Batteries self-contained.

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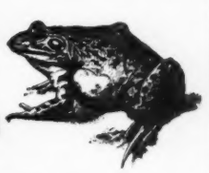

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Our hooks are heavily galvanized and will stand long exposure, and our kind of Marline will outlive any hook.

Prices Very Low for Any Quantity.

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TOLEDO, O.

CEDAR POLES

LARGE BUTTS

We cut poles from lands owned by our Company in Northern Michigan on Lake Superior Shore, where the cedar is very **sound** and **stocky** with **heavy butts.**
All sizes in stock all the year round.

Write for a Copy of Our Telegraph Code for Cedar Products Giving Valuable Information About Poles.

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CEDAR POLES

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SAND POINT, IDAHO.

All Sizes Large Stock Low Prices
Prompt Shipments

LONG POLES A SPECIALTY.
WRITE FOR PRICES.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

We will have to offer this year's cut--all taken from our own stumpage:

4-5-6 and 7" Posts	118,000
4-5 and 6" 20-ft.	17,500
5-6 and 7" 25-ft.	17,600
7 and 8" 30-ft.	3,400
7 and 8" 35-ft.	1,500
7 and 8" 40-ft.	400

This stock is gilt edge, sound butts, stocky poles.

No matter how particular you are about specifications, we can fill your orders out of this stock.

Shipments, May 15th.

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ALL LENGTHS AND SIZES

We desire especially to move
5 in. 30 ft., 6 in. 30 ft.
Send us your inquiries for
8 in. 45 ft. and larger

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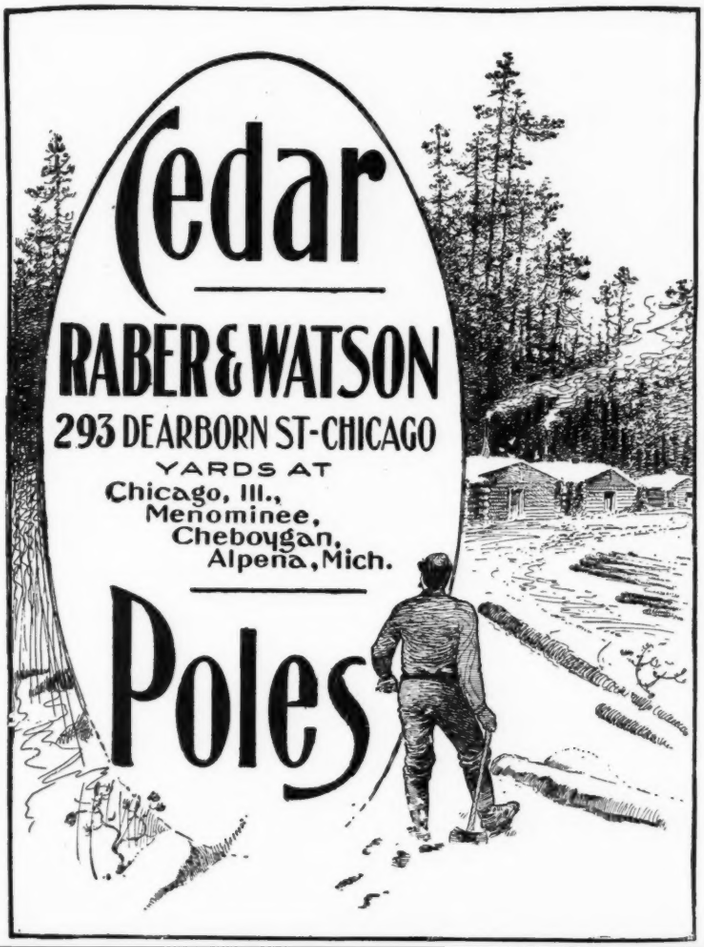

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Rochester Telephone Company

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Gentlemen: I was in Chicago last week and intended seeing you, but was very busy while there, and did not get to your office, very much to my regret. Our Poles are arriving in sections, that is a car at a time, nearly all of them have been received. You certainly did yourself credit in the matter, as the unanimous opinion of everyone that have seen them is, that they are "the best lot of poles that ever came to Rochester."

Thanking you, I remain,
Yours truly,
C, O. HARRIS.

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CEDAR POLES

FROM THE STUMP TO THE LINE.

WE ALWAYS CARRY A LARGE STOCK OF ALL SIZES OF WHITE CEDAR POLES, AND HAVING YARDS ON ALL PRINCIPAL RAILROADS IN NORTHERN MICHIGAN AND MINNESOTA, ARE IN POSITION TO MAKE IMMEDIATE SHIPMENT.

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All Sizes *Large Stock*
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Send us your inquiries, which will receive our immediate attention.
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We make a Specialty of Michigan White Cedar.
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Send in your orders. Sorting and Shipping Yards all through Michigan. Twenty-Five Years in the Pole Business.
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STOMBAUGH GUY ANCHORS

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We will ship on 30 days' trial any number of Stombaugh Guy Anchors over twelve. Test them, pay for them if satisfactory. Otherwise return them freight collect. We prepay freight on first order.

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Good Service
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CEDAR POLES

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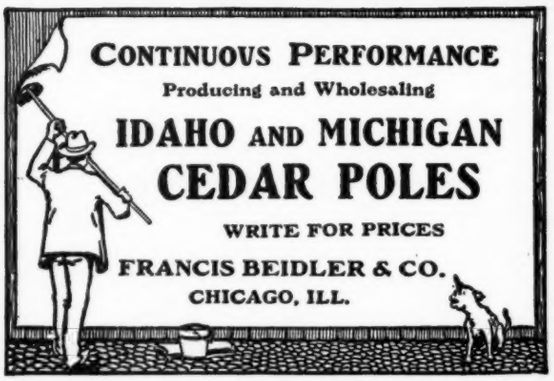

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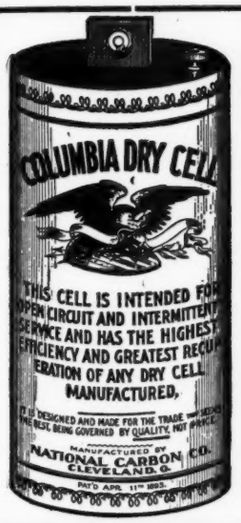
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MANUFACTURED,
IT IS DESIGNED AND MADE FOR THE TRADE
WHO DESIRE BEING GOVERNED BY QUALITY, NOT PRICE.
MANUFACTURED BY
NATIONAL CARBON CO.
CLEVELAND, O.
PAT'D APR. 11TH 1893.

By Reason

of the LONG LIFE of COLUMBIA DRY CELLS you can SAVE:

INSPECTORS TIME
TROUBLE
MONEY

Has this ever occurred to you?

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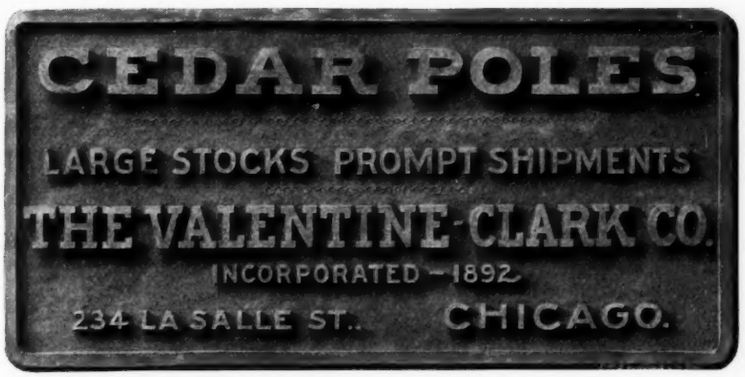

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HARD DRAWN COPPER WIRE

GALVANIZED WIRE STRAND FOR POLE GUYS AND CABLE SUPPORT

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JOHN A. ROEBLING'S SONS CO.

TRENTON, N. J.

Branch Offices and Warehouses: NEW YORK CHICAGO CLEVELAND SAN FRANCISCO

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WANTED—Position with telephone company as manager or superintendent. Many years' practical experience. Technical education. Best of references furnished. Will take stock to a limited amount as part salary, if desired. Address 294, care TELEPHONY.

FOR SALE—Latest steel rod, or metal operators' chairs. Special discount during June. Electrical Publishing & Supply House, Rokeby and Graceland Ave., Chicago.

FOR SALE OR TRADE—970 acres of fine timber land in Minnesota, sixty miles north of St. Paul and Minneapolis, for telephone plant or telephone bonds. Address 290, care TELEPHONY.

WANTED—Position as manager or superintendent of telephone plant or system. Many years' practical experience. Best of references furnished. Address 291, care TELEPHONY.

FOR SALE—We have about 150 Eureka Drops that are in good condition nad which we will sell cheap. The Hanover Telephone Co., Hanover Kansas.

FOR SALE—Telephone Exchange in northwest Iowa. 150 telephones in operation, paying 25% on the investment. For full particulars and price, address C. G. Reed, Laurens, Iowa.

320 ACRES good land, Trego Co., Kansas, to trade for telephone exchange showing opportunity for development. Give price and full particulars first letter. Address C. C. Bestor, Marysville, Kas.

White Cedar Poles

FROM A SATISFIED NEBRASKA CUSTOMER

"We received car of 5" 25's this A. M., only five days since you started them on the way—seven days after we sent you the order. We thank you for your promptness and compliment you on your way of doing things.

We have been buying poles for several years, but this is the best ever."

PAGE & HILL CO.,

CEDAR POLE SPECIALISTS,

Lumber Exchange, Minneapolis, Minn.

WOOD PRESERVING

POLES AND CROSS ARMS

TREATED WITH ANY OF OUR VARIOUS PROCESSES

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Capacity Based on 24 Hours Treatment, 75,000,000 B. M. Feet Per Year.

TELEPHONE PRINCIPLES AND PRACTICE

By George Walker Wilder, Ph.D.

Professor in Telephony in the Armour Institute of Technology.

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XIII.	Ringers.	XXVIII.	Construction of the wire plant
XIV.	The Generator Shunt.	XXIX.	Cables.
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		XXXI.	Line Disturbances.
		XXXII.	Electrical Testing.

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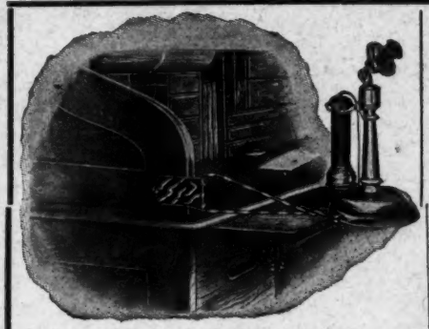
BRASS DRILL ROD
German Silver, Brass and Copper **WIRE**
BRAZED and SEAMLESS TUBING

The Plume & Atwood Mfg. Co.
199 Lake Street, Chicago



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THE WEISS MFG. CO.
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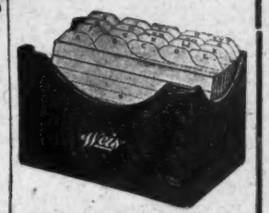

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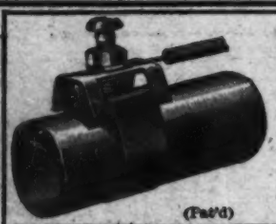

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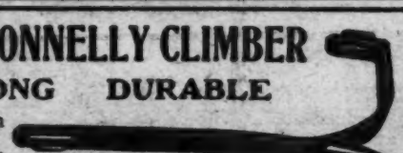

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